



INSTALLATION/OPERATION MANUAL

XtremeProjection™ Series

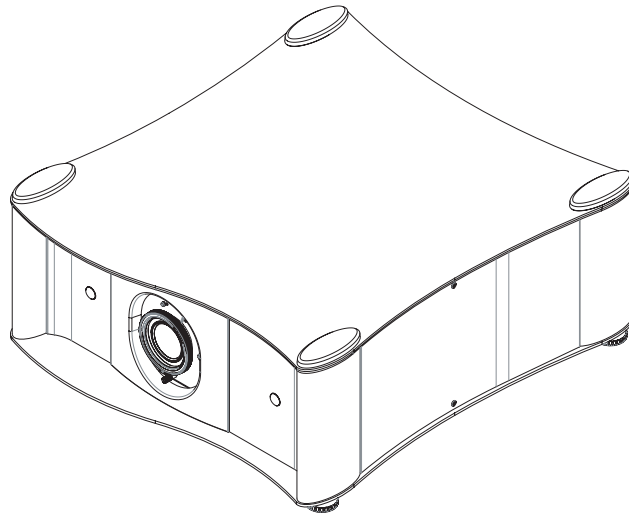
X-200i

Active 3D Home Theater Projector

X-200i

X-200i/CineWide

X-200i/CineWide with AutoScope



THE WORLD'S FINEST HOME THEATER PRODUCTS™

RuncoCare™ Standard Two Year Limited Warranty

Congratulations on your purchase of a Runco® product! With proper installation, setup and care, you should enjoy many years of unparalleled video performance.

This Limited Warranty is provided free of charge by Runco International, LLC (“Runco”) with the purchase of a covered Runco product. This Limited Warranty is applicable to all Runco projectors, processors, LCD display and plasma display products, with the exception of the following models: XP-103DHD, SC-1 and SC-1a¹. This Limited Warranty applies to purchases of covered Runco products occurring on or after **June 1, 2011**.

RuncoCare™ Limited Warranty Coverage

Runco warrants its products to be free from defects in material and workmanship during the warranty period provided below. If a product proves to be defective in material or workmanship during the warranty period, Runco will repair the product, replace the product with a substantially similar new or like-new product, or refund a prorated share of the purchase price (calculated based on the remainder of the warranty period and the then-current, most-recent MSRP² of a similar product), if repair or replacement of the product is determined by Runco to not be feasible.

Length of RuncoCare™ Warranty Period

Runco products are warranted for two (2) years from the date of shipment from Runco. Lamps are warranted six (6) months from the date of shipment or 1000 hours of use, whichever comes first. A replacement lamp is warranted for the remaining portion (if any) of the original warranty period or ninety (90) days from the date it was shipped to you, whichever is longer. All other accessories, which include but are not limited to cables, remotes, carrying cases, lens cap and other peripherals sold with the Runco product, are warranted for ninety (90) days from the date of shipment.

RuncoCare™ Eligibility

This Limited Warranty is valid only in the country where the Product was originally purchased and for the buyer who originally purchased the covered product from the authorized Runco dealer or distributor. This warranty is not transferable; it is not valid for any subsequent buyer (if any). You may be required to provide proof of purchase in order to receive warranty services.

-
1. Runco may update this list of products excluded from this warranty from time to time at Runco’s sole discretion, but updates will not apply on a retroactive basis.
 2. MSRP is defined as the most recent product price listed on Runco’s price list.

RuncoCare™ Standard Claim Procedure

- In the event of a product defect, please follow the claim procedure provided below:
 - A. Register your product if you have not yet done so. Visit <http://www.runco.com/support/product-registration/> to register the product.
 - B. Contact your original authorized dealer or distributor who sold the product.
 - C. The dealer/distributor will contact Runco Technical Support via email at support@runco.com or via phone at 1-800-23-RUNCO (1-800-237-8626).
- The dealer/distributor will provide to Runco proof of purchase, serial number, product model number, description of the problem and any troubleshooting steps already attempted.
- Runco's technical support staff will attempt to assist the dealer/distributor in troubleshooting any technical issues that might be causing the product to malfunction. If Runco is unable to resolve the problem through troubleshooting, a Return Material Authorization (RMA) number will be issued for the exchange of the defective product if it is determined that the claim is covered by the warranty. Once an RMA has been created, RMA status is available at serviceorders@runco.com.
- If an RMA is issued, the dealer or customer will need to return the defective product to the Runco repair depot location specified by the Runco technical support representative. The dealer or customer will need to properly package the defective product in a suitable shipping container consisting of the product only, and not include any accessories (e.g., cables, remotes, carrying cases, lens, lens cap and other peripherals). Boxes may be purchased from a Runco technical support representative.
- The dealer or customer is responsible for paying freight charges and insurance to ship the defective product to the Runco repair depot location. If there are any shipping damages, the dealer or customer will need to address and resolve any shipping damage claims directly with the shipping company.
- Runco will not accept a returned product unless an RMA has been issued by Runco.
- For in-warranty repairs, Runco will pay freight charges to return the repaired/replacement product to the dealer/distributor from the Runco repair depot. For select countries or geographies Runco will ship via an economy express service. Return delivery time and availability may vary based on origin and destination, and Runco is unable to deliver to PO Box and FPO Box addresses.
- Note: in the 48 contiguous United States, other options for on-site service or advance exchange for the product may apply, if you purchased the Runco PremierCare™ Service Plan.

What to Include with Your Return

1. Return only the defective product with the lamp (if applicable).
2. Runco will not be responsible for returning or replacing any accessories (e.g., cables, remotes, carrying cases, lens, lens cap and other peripherals sold with the Runco product) that are returned with the defective product.
3. Repaired or replacement products will be shipped with a lamp (if applicable) but without any accessories.

RuncoCare™ Warranty Exclusions

This Limited Warranty does not include and is limited by the following:

1. Products not purchased from an authorized Runco dealer
2. Rental costs incurred by the customer in the event of product defect or failure
3. Any product with a defaced, modified, or removed serial number

-
4. Damage, deterioration, or malfunction resulting from:
 - A. Accident, abuse, misuse, neglect, improper ventilation, fire, water, disaster, lightning, or other acts of nature, smoke exposure (cigarette or otherwise), unauthorized product modification (including use of an unauthorized mount), or failure to follow instructions supplied with the product
 - B. Repair or attempted repair by anyone not authorized by Runco
 - C. Any damage to the product due to shipment
 - D. Removal or installation of the product
 - E. Causes external to the product, such as electric power fluctuations or failure
 - F. Use of supplies or parts (including lamps) that are not purchased from Runco or do not meet Runco's specifications
 - G. Normal wear and tear
 - H. Expected lamp degradation and normal decrease in lamp output over a period of time or as the lamp is consumed
 - I. Customer caused defects, including but not limited to, scratched/defaced/altered plastics
 - J. Failure to follow maintenance procedures as outlined in the product's user guide where a schedule is specified for regular cleaning of the product
 - K. Opening the product and/or tampering with internal circuitry
 - L. Products lost, stolen or discarded
 - M. Any damage or dissatisfaction associated with latent images, "burnin," or any other damage determined by Runco to be the result of customer use patterns
 - N. Any other cause, which does not relate to a product defect in material or workmanship
 5. Removal, installation, and set-up service charges are excluded from the warranty.
 6. Black uniformity issues or other LCD issues associated with usage outside the Runco recommended guidelines and specifications for the product.
 7. Bright or dark sub pixels that are characteristic of LCD technology and considered by Runco to be acceptable and within Runco's manufacturing specifications.

Specifically, it is not uncommon for one or more sub pixels to become bright or dark during or after the manufacturing process. A bright sub pixel is one that remains in the on position, and a dark sub pixel is one that appears black or off. The sub pixels are usually hard to see and will not detract from the display quality or usability at normal viewing distance. The following are Runco's criteria for identifying bright or dark sub pixels that would be considered unacceptable: a) the number of bright or dark sub pixels; b) the location of the bright or dark sub pixels; c) the color of the bright sub pixels; and d) the Runco model size. If sub pixels have been identified as unacceptable by Runco the LCD will be deemed faulty and will be replaced if reported within the warranty period.

Other Terms and Conditions

1. If the defective product is not properly packaged and is damaged in transit during its return to Runco, you may be invoiced for either the repair costs, if repairable, or the MSRP of a replacement product and shipping costs incurred by Runco.
2. The repaired or replaced product will assume the remainder of your original product's warranty term or 90 days from the date the repaired or replaced product is shipped, whichever is longer.
3. If a replacement product is sent, the replacement becomes the property of the customer and the defective product becomes the property of Runco.

RuncoCare™ Extended Service Options

Runco offers extended and expanded service plans. For information on additional product protection, please ask your authorized Runco dealer, email serviceorders@runco.com or call (toll free) (800) 23RUNCO (800-237-8626).

Exclusion of Implied Warranties

RUNCO PROVIDES NO WARRANTIES, EXPRESS OR IMPLIED, EXCEPT THOSE EXPRESSLY PROVIDED IN THIS DOCUMENT. RUNCO EXPRESSLY DISCLAIMS AND EXCLUDES ALL OTHER WARRANTIES, INCLUDING THE IMPLIED WARRANTIES OF TITLE, NONINFRINGEMENT, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Limitation of Liability; Exclusion of Damages

RUNCO'S MAXIMUM AGGREGATE LIABILITY IS LIMITED TO THE COST OF REPAIR, REPLACEMENT OR REFUND OF THE PRODUCT.

RUNCO WILL NOT BE LIABLE FOR DAMAGE TO OTHER PROPERTY OR FOR DAMAGES BASED UPON INCONVENIENCE, LOSS OF USE OF THE PRODUCT, LOSS OF TIME, LOSS OF PROFITS, LOSS OF BUSINESS OPPORTUNITY, LOSS OF GOODWILL, INTERFERENCE WITH BUSINESS RELATIONSHIPS, OR OTHER COMMERCIAL OR FINANCIAL LOSS, EVEN IF RUNCO IS AWARE OF THE POSSIBILITY OF SUCH DAMAGES AND EVEN IF A REMEDY HAS FAILED OF ITS ESSENTIAL PURPOSE.

RUNCO WILL NOT BE LIABLE FOR ANY CONSEQUENTIAL, INCIDENTAL, INDIRECT, EXEMPLARY, SPECIAL, PUNITIVE OR ANY OTHER TYPE OF DAMAGES, WHETHER THE CLAIM IS BASED ON CONTRACT, TORT, PRODUCT LIABILITY, NEGLIGENCE, STRICT LIABILITY OR ANY OTHER LEGAL OR EQUITABLE THEORY.

RUNCO WILL NOT BE LIABLE FOR ANY CLAIM AGAINST THE CUSTOMER BY ANY OTHER PARTY.

Effect of Local Law

This Limited Warranty gives you specific legal rights, and you may have other rights, which vary from locality to locality. Some localities do not allow limitations on implied warranties and/or do not allow the exclusion of incidental or consequential damages, so the above limitations and exclusions may not apply to you.

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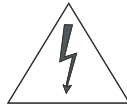
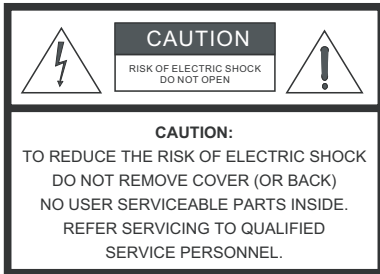
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The trademarks reproduced in this Runco Owner's Manual and used on the Runco Products are either owned by Runco or are licensed by Runco. You may not reproduce or use the trademarks without the prior written consent of Runco.

Runco Products are manufactured under one or more of the following patents: US. Patent 6755540 and Other Patents Pending.

Important Safety Instructions

Thank you for your purchase of this quality Runco video product! For the best performance, please read this manual carefully as it is your guide through the menus and operation.



WARNING

This symbol is intended to alert the user to the presence of uninsulated “dangerous voltage” within the product’s enclosure that may be of sufficient magnitude to constitute a risk of electric shock.



This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with a dry cloth.
7. Do not block any of the ventilation openings. Install in accordance with the manufacturer’s instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. When the provided plug does not fit into your outlet, consult an electrician for the replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles and the point where they exit from the apparatus.
11. Only use the attachments/accessories specified by the manufacturer.
12. Use only with a cart, stand, tripod, bracket or table specified by the manufacturer or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus to avoid injury from tip-over.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. The +12V trigger only outputs 12Vdc signal for triggering. Do not connect to any other power input or output. This could cause damage to this unit.
16. Keep the packing material in case the equipment should ever need to be shipped.
17. The lamp becomes extremely hot during operation. Allow the projector to cool down for approximately 45 minutes prior to removing the lamp assembly for replacement.
18. Do not operate lamps beyond the rated lamp life. Excessive operation of lamps beyond rated life could cause them to explode in rare occasions.
19. Never look directly into the lens when the lamp is on.



IMPORTANT HEALTH AND SAFETY INFORMATION FOR 3D VIEWING:

Please read and make sure you understand the following safety information before using the product for viewing 3D content. Provide this information to the end users of this product and ensure that they understand it.



It is widely recognized that stereographic display devices can cause discomfort, including, without limitation, dizziness, nausea, headaches, eye fatigue and eye-strain, in some individuals. The 3D effect and experience will vary by individual, depending on a variety of factors, including his or her health and vision. Runco recommends that users take regular breaks when watching 3D video or playing games using stereoscopic displays. Discontinue use if any discomfort occurs. Parents of young children should ensure their children avoid extensive exposure to electronic stereographic entertainment.

The quality and appropriateness of the 3D screen materials onto which the image is projected and the quality of the 3D content being displayed both have a significant and noticeable impact on the overall 3D experience. A properly-calibrated projection system, including glasses and an optimized third-party screen, displaying high-quality 3D content is the best formula for immersive and comfortable 3D experiences in the home. Please refer to the remainder of this manual for proper projector installation and usage instructions.

The glasses that accompany this product are not safe to use as sunglasses, protective eyewear or any use outdoors or other than only in conjunction with the proper operation of the Runco product with which they are sold. It is common to dim the lights in a home theater. Using 3D glasses and the immersive imagery of stereoscopic imagery can increase the risk of tripping or falling the dark. Special care should be taken.

Do not tilt your head while using the 3D glasses.

Compliance Information

DECLARATION OF CONFORMITY:

Manufacturer's Name: Runco International, LLC

Manufacturer's Address: 1195 NW Compton Drive, Beaverton, OR 97006-1992

hereby declares that the Products' Model Numbers:

X-200i, X-200i/CineWide and X-200i/CineWide with AutoScope

conform with the provisions of:

Council Directive 2004/108/EC on Electromagnetic Compatibility;

EN 55022 "Limits and methods of measurements of radio interference characteristics of information technology equipment" 1998;

EN 55024 "Limits and methods of measurements of immunity characteristics of information technology equipment" 1998;

Including:

- EN 61000-4-2 "Electromagnetic compatibility (EMC) Part 4: Testing and measurement techniques Section 2: Electrostatic discharge immunity test"
- EN 61000-4-3 "Electromagnetic compatibility (EMC) Part 4: Testing and measurement techniques Section 3: Radiated, Radio-Frequency, Electromagnetic Field Immunity Test"
- EN 61000-4-4 "Electromagnetic compatibility (EMC) Part 4: Testing and measurement techniques Section 4: Electrical fast transient/burst immunity test"
- EN 61000-4-5 "Electromagnetic compatibility (EMC) Part 4: Testing and measurement techniques Section 5: Surge immunity test"
- EN 61000-4-6 "Electromagnetic compatibility (EMC) Part 4: Testing and measurement techniques Section 6: Conducted disturbances induced by radio-frequency fields immunity test"
- EN 61000-4-8 "Electromagnetic compatibility (EMC) Part 4: Testing and measurement techniques Section 8: Conducted disturbances induced by power frequency magnetic fields immunity test"
- EN 61000-4-11 "Electromagnetic compatibility (EMC) Part 4: Testing and measurement techniques Section 11: Voltage dips, short interruptions and voltage variations immunity tests"

And:

- EN 61000-3-2 "Electromagnetic compatibility (EMC) Part 3, Section 2: Limits for harmonic current emissions (equipment input current up to and including 16 A per phase)" 2000;
- EN 61000-3-3 "Electromagnetic compatibility (EMC) Part 3, Section 3: Limitations of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current up to and including 16 A and not subject to conditional connection" 1995;

Council Directive 2006/95/EC and amended by M1 and C1 on Low Voltage Equipment Safety;

EN 60950 "Safety of information technology equipment, including electrical business equipment"

The Technical Construction file required by this Directive is maintained at the corporate headquarters of Runco International, LLC, located at 1195 NW Compton Drive, Beaverton, OR 97006-1992.

Date of Declaration: September 2012

FCC PART 15:

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

INDUSTRY CANADA (ICES-003):

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

PRODUCT DISPOSAL:

The Product contains small amounts of tin, lead and/or mercury. Disposal of these materials may be regulated due to environmental considerations.

IMPORTANT RECYCLE INSTRUCTIONS



Lamp(s) inside this product contain mercury. This product may contain other electronic waste that can be hazardous if not disposed of properly. Recycle or dispose in accordance with local, state, or federal Laws.

For more information, contact the Electronic Industries Alliance at WWW.EIAE.ORG.

For lamp specific disposal information check WWW.LAMPRECYCLE.ORG.

DISPOSAL OF OLD ELECTRICAL AND ELECTRONIC EQUIPMENT (Applicable throughout the European Union and other European countries with separate collection programs)



This symbol found on your product or on its packaging, indicates that this product should not be treated as household waste when you wish to dispose of it. Instead, it should be handed over to an applicable collection point for the recycling of electrical and electronic equipment. By ensuring this product is disposed of correctly, you will help prevent potential negative consequences to the environment and human health, which could otherwise be caused by inappropriate disposal of this product. The recycling of materials will help to conserve natural resources. This symbol is only valid in the European Union. If you wish to discard this product, please contact your local authorities or dealer and ask for the correct method of disposal.

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1. Introduction

This Owner's Manual describes how to install, set up and operate the Runco XtremeProjection™ Series X-200i Active 3D Home Theater Projector.

Throughout this manual, the Runco XtremeProjection™ Series X-200i Active 3D Home Theater Projector is referred to as the "X-200i."

Runco has prepared this manual to help home theater installers and end users get the most out of the X-200i.

Runco has made every effort to ensure that this manual is accurate as of the date it was printed. However, because of ongoing product improvements and customer feedback, it may require updating from time to time. You can always find the latest version of this and other Runco product manuals on-line, at www.Runco.com.

Runco welcomes your comments about this manual. Send them to info@Runco.com.

Text Conventions: The following conventions are used in this manual, in order to clarify the information and instructions provided:

- Remote control and keypad button identifiers are set in upper-case bold type; for example, "Press **EXIT** to return to the previous menu."
- Computer input (commands you type) and output (responses that appear on-screen) is shown in monospace (fixed-width) type; for example: "To change the aspect ratio to Letterbox, type `op aspect = 1 <Enter>`."
- All keys with functional names are initial-capped, set in bold type and enclosed in angle brackets. These keys are the following: **<Enter>**, **<Spacebar>**, **<Control>**, **<Esc>** and **<Tab>**.
- **<Enter>** indicates that you may press either the RETURN or ENTER key on your keyboard if it has both keys.

In addition to these conventions, underlining, boldface and/or italics are occasionally used to highlight important information, as in this example:



Note

*A carriage return **must** be used after each command or string.*

1.1 About This Manual

◀ Target Audience

◀ If You Have Comments About This Manual...

◀ Textual and Graphic Conventions

Graphic Conventions: These symbols appear in numerous places throughout the manual, to emphasize points that you must keep in mind to avoid problems with your equipment or injury:



Tip

TIPS highlight time-saving short cuts and helpful guidelines for using certain features.



Note

NOTES emphasize text with unusual importance or special significance. They also provide supplemental information.



Caution

CAUTIONS alert users that a given action or omitted action can degrade performance or cause a malfunction.



WARNING

WARNINGS appear when a given action or omitted action can result in damage to the equipment, or possible non-fatal injury to the user.



DANGER!

DANGER appears when a given action can cause severe injury or death.

1.2 Using This Manual

Use the following table to locate the specific information you need in this manual.

If you need...	... Turn to page:
Information about obtaining service	iv
General information about the XtremeProjection™ Series X-200i Active 3D Home Theater Projector	3
Installation instructions	13
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Runco's XtremeProjection™ Series X-200i Active 3D Home Theater Projector — the flagship member of the XtremeProjection series — is a single-chip DLP projector that, uncalibrated, measures 1,430 ANSI lumens and when calibrated to Runco's CSMS™ specifications, achieves a light output of 50 Foot-Lamberts (fL). Featuring integrated processing and multiple lens options, the 3D-capable X-200i comes equipped with three pairs of active 3D glasses and relies on frame-sequential 3D technology to ensure that users can enjoy 2D and 3D content on the same screen, with full 1080p HD resolution delivered to both eyes.

Designed specifically for the custom installer who specializes in high-end theaters and appreciates craftsmanship and video quality, the X-200i brings big screen experiences to the home. The X-200i relies on a combination of state-of-the-art, DLP-based SuperOnyx™ technology and proprietary electronics, processing and optics to deliver stunning images in both 2D and 3D. The X-200i incorporates the ISF™ (Imaging Science Foundation) calibration suite for optimal performance, including ISF Day and ISF Night presets for the ultimate video performance any time of day.

For unparalleled widescreen reproduction of movies originally filmed in the CinemaScope™ 2.35:1 format, the X-200i can also be paired with Runco's award-winning CineWide™ technology. Through an ingenious combination of software, electronics and precision anamorphic optics, CineWide maintains constant image height on the screen just as in a movie theater. When a viewer transitions from 1.78:1 (16:9) program material to superwide 2.35:1, the image simply gets wider while image height is maintained.

With Runco CineWide, the projection system is able to use the full pixel array, thereby producing a 2.35:1 image with enhanced resolution and increased brightness. No resolution or image area is lost to those black bars that contain no picture information.

**Note**

CineWide requires the use of a 2.35:1 (or similar aspect ratio), "superwide" format screen.

Rounding out this impressive projector are discrete input source, aspect ratio and power on/off, as well as an RS-232 interface for seamless integration with automation control systems.

1.3 Description, Features and Benefits

- Key Features and Benefits** ➤ The X-200i offers these key features and benefits:
- Native Resolution: 1920 x 1080 (16:9 Native Aspect Ratio)
 - DLP system using high-performance Digital Micromirror Device (DMD)
 - Customized color wheel produces wide dynamic range and rich grayscale
 - Two (2), HDMI Inputs with High-bandwidth Digital Content Protection (HDCP)
 - HDMI 1.4a Full-HD 3D Support
 - HDTV Compatible
 - Very high optical contrast
 - Horizontal and vertical lens shift

- Parts List** ➤ Your X-200i is shipped with the following items. If any items are missing or damaged, please contact your Runco dealer or Runco Customer Service at (800) 23RUNCO.
- XtremeProjection™ Series X-200i Active 3D Home Theater Projector
 - Remote Control Unit and two (2), AA-size batteries
 - AC Power Cords (North America, Europe, United Kingdom)
 - Cleaning Cloth
 - 5.0-mm Hex wrench (for lens shift adjustment)
 - Active 3D Emitter and projector interface cable, 3.28 feet (1.0 meters)
 - Active 3D Glasses (3 pairs)
 - Runco X-200i Quick Setup Guide

Optional Accessories:

- CineWide™ technology (fixed, secondary anamorphic lens)
- CineWide™ with AutoScope™ system (secondary anamorphic lens and motorized mount)
- Additional 3D glasses
- Ceiling mount kit (part number 956-0074-00)
- Short-throw primary lens, 1.56:1-1.86:1
- Long-throw primary lens, 2.40:1-4.00:1 (part number 160-0774-00)
- Replacement Lamp

2. Controls and Functions

Figure 2-1 shows the key X-200i functional components.

2.1 X-200i at a Glance

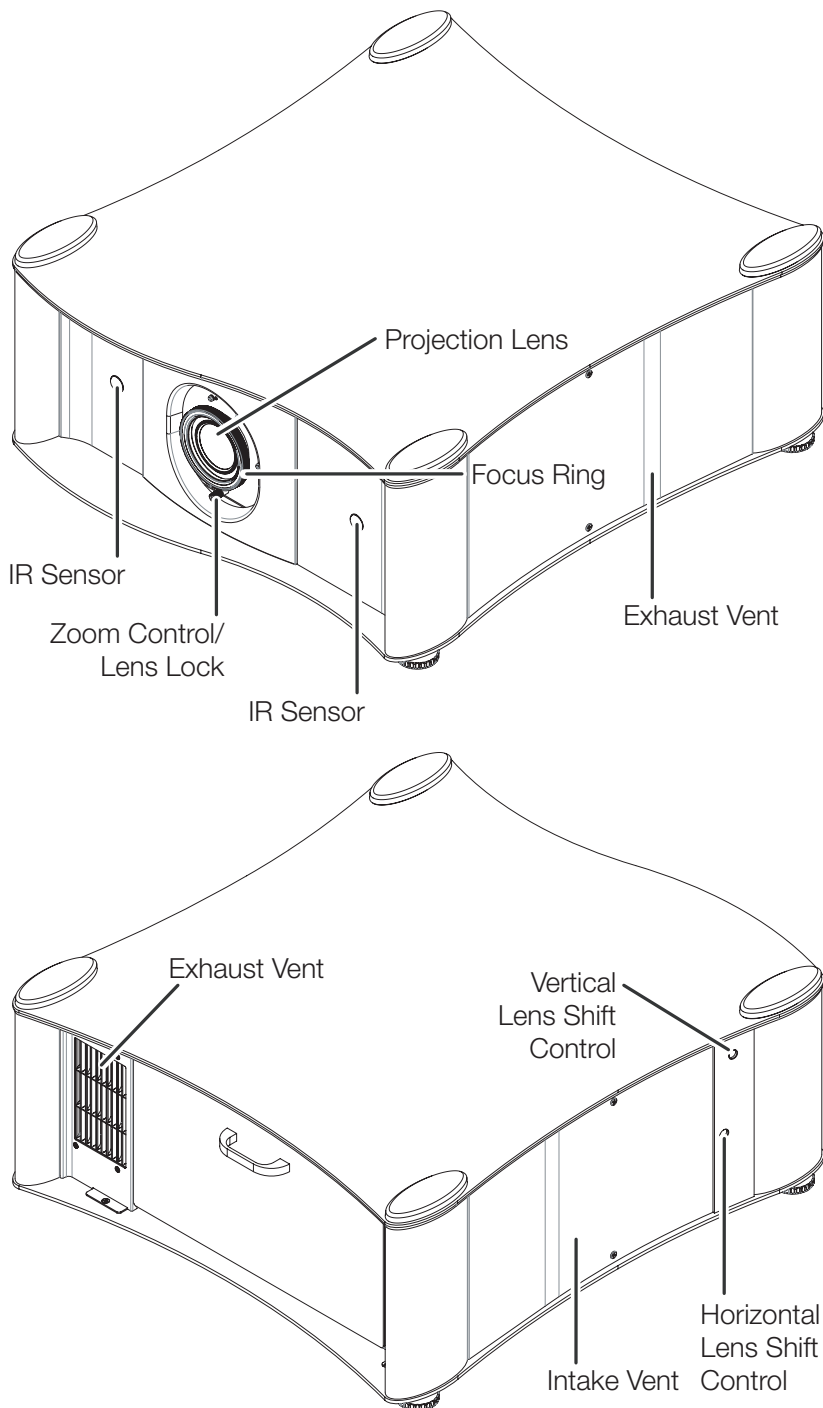


Figure 2-1. X-200i Key Functional Components

- **PROJECTION LENS**

Available in three versions: standard throw range (1.85:1 to 2.40:1), short throw range (1.56:1 to 1.86:1) and long throw range (2.40:1 to 4.00:1).

- **IR SENSORS**

Two sensors on the front of the projector receive infrared signals from the remote control unit.

- **FOCUS RING**

Rotate this to focus the projected image.

- **ZOOM CONTROL / LENS LOCK**

Move this from side to side to change the projected image size. To lock the position of the lens, tighten the knob with a flat-blade screwdriver.

- **REAR DOOR**

Open this door to access the lamp compartment, input panel and system keypad (refer to ***X-200i Rear Panel*** on page 7).

- **HORIZONTAL AND VERTICAL LENS SHIFT CONTROLS**

To use the lens shift controls, first ensure that the lens lock is not engaged. Then, insert the included 5.0-mm Hex wrench into the opening and turn it as needed to shift the lens in the desired direction (refer to ***Lens Adjustments*** on page 37).



Caution

Do not attempt any lens adjustments when the lens lock is engaged. Doing so may cause damage to the zoom or lens shift mechanisms.

- **EXHAUST VENTS**

Warm air exits the projector through these vents. Ensure that they are not blocked.

- **INTAKE VENT**

Internal fans draw cool air into the projector through this vent.

Figure 2-2 shows the X-200i rear panel.

2.2 X-200i Rear Panel

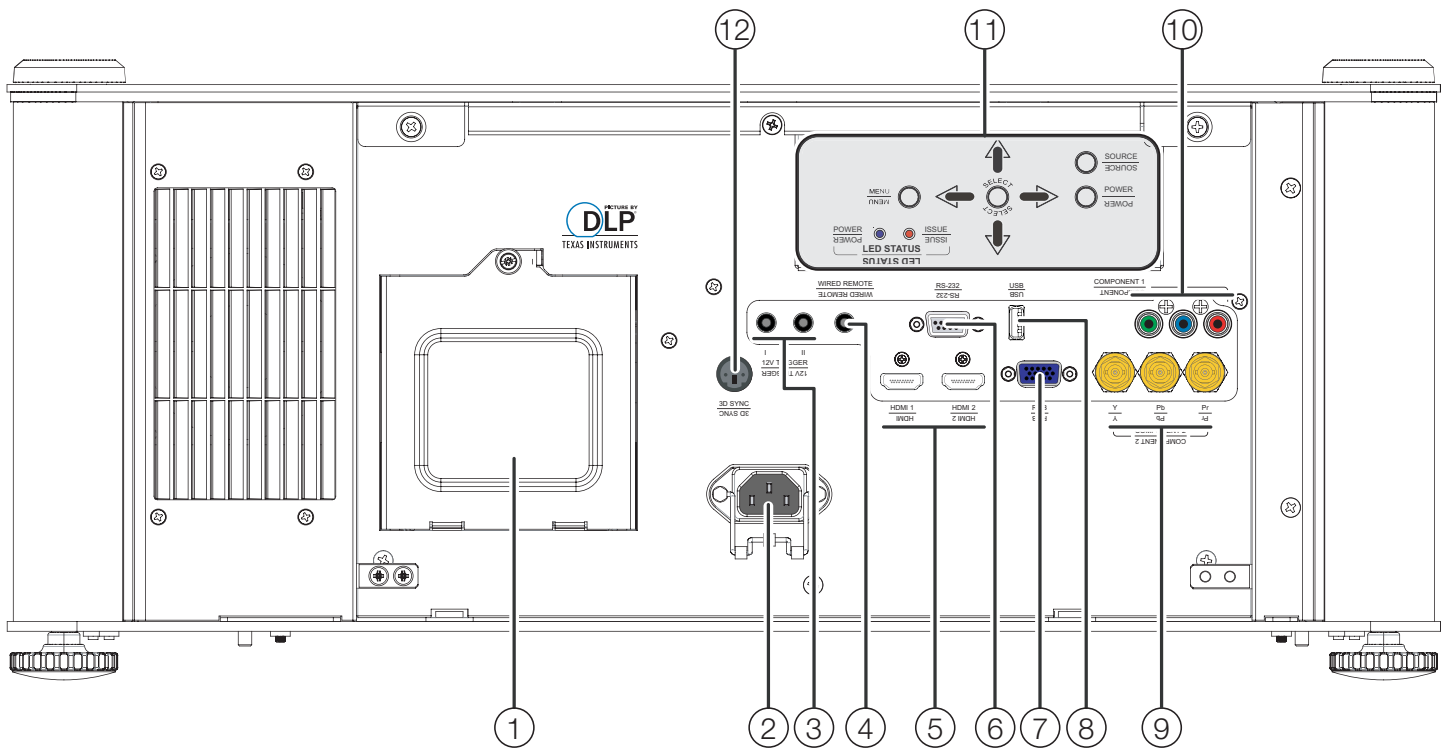


Figure 2-2. X-200i Rear View (without Door)

1. **LAMP COMPARTMENT COVER**
Remove this cover to access the lamp compartment when replacing the lamp.
2. **POWER INPUT (100 to 240 VAC)**
Connect the X-200i to power here.
3. **TRIGGER 1 (3.5-mm, mini phono jack)**
TRIGGER 2 (3.5-mm, mini phono jack)
Provide 12 (+/- 1.5) volt switched output for screen relays with 250mA current capacity and short protection.
4. **WIRED REMOTE**
Wired input from a Niles- or Xantech-compatible, infrared (IR) repeater system. It is a 3.5-mm, mini phono jack, wired as follows:
Ring = No connection
Tip = IR Input
Sleeve = Ground
5. **HDMI 1 (Digital)**
HDMI 2 (Digital)
HDCP-compliant digital video inputs for connecting an HDMI or DVI source.

6. **RS-232**
A female, 9-pin D-sub connector for interfacing with a PC or home theater automation/control system.
7. **RGB**
Provides a standard, 15-pin VGA-style connection to either an RGB or component high-definition source, or to a personal computer. The X-200i automatically detects the input signal resolution.
8. **USB**
A standard, Type A USB connector for performing firmware upgrades. Can also provide power to a 3D emitter.
9. **COMPONENT 2**
Three BNCs for connecting component (YPbPr) video sources.
10. **COMPONENT 1 (RCA connectors)**
Standard- or high-definition (480i/480p/576i/576p/720p/1080i/1080p) Component (YPrPb) input for connecting a DVD/HD-DVD/BD player, HD set-top box or other SD/HD source.
11. **SYSTEM KEYPAD AND LED INDICATORS**
Provides an alternative to using the remote control unit to navigate the On-Screen Display (OSD) controls (refer to **Controls and Indicators** on page 9).
12. **3D SYNC**
A 3-pin, VESA standard mini-DIN connector for connecting the Active 3D Emitter to the projector (see Figure 3-17).

An eight-button keypad on the projector rear panel provides an alternative to the remote control unit for controlling the projector.

Two LEDs next to the keypad provide visual indications of the current operational state of the projector. During normal operation, both of these LEDs are off.

1. **MENU**

Press this button to show or hide the OSD controls.

2. **LEFT (◀)**

Use this button to move the cursor left in the OSD.

3. **SELECT**

Press to select a highlighted menu item or confirm a changed setting.

4. **UP (▲)**

Use this button to move the cursor left in the OSD.

5. **RIGHT (▶)**

Use this button to move the cursor right in the OSD.

6. **SOURCE**

Press this button repeatedly to select a video source.

7. **POWER** ⏻

Press once to turn on the X-200i. Press it again to put the projector into Standby mode. For a discrete on or off command, you can use the direct access buttons on the remote control (see **X-200i Remote Control** on page 10).

8. **DOWN (▼)**

Use this button to move the cursor down in the OSD.

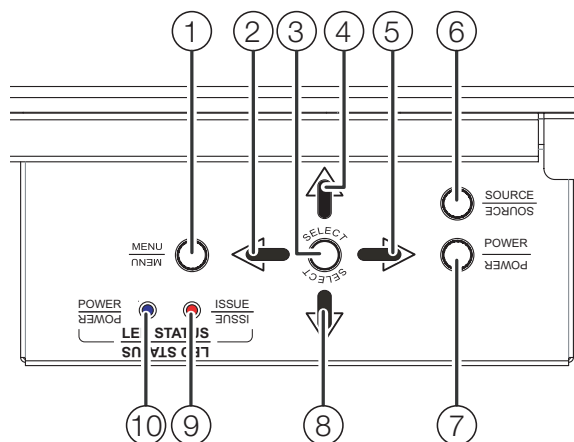
9. **ISSUE LED (Red)**

Indicates various error conditions, as follows:

- Flashes once to indicate a lamp problem (unable to strike, end of life); user intervention likely to fix problem.
- Flashes twice in quick succession to indicate that the lamp door is open.
- Flashes four times in quick succession to indicate an “over temperature” condition; user intervention (clear vents, turn on AC) may fix problem.
- Lights solid to indicate an error that requires servicing (fan fail, Power-on self-test fail etc.).
- During normal operation, this LED is off.

10. **POWER LED (Blue)**

- Lights solid to indicate that the projector is in standby mode, ready to start.
- Flashes (one half-second on/one half-second off) for approximately 90 seconds after the system is turned on (warm-up) or turned off (cool-down).
- During normal operation, this LED is off.



2.3 Controls and Indicators

2.4 X-200i Remote Control

1. **ON**
Use this button to turn the projector on.
2. **OFF**
Use this button to turn the projector off.
3. **Aspect Ratio Selection Buttons**
Press one of these buttons to select an aspect ratio:

16 : 9: For viewing 16:9 DVDs or HDTV programs in their native aspect ratio.

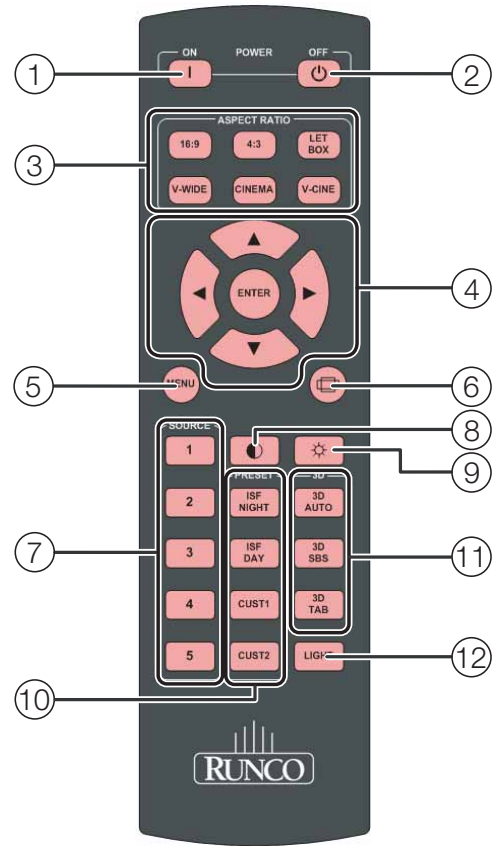
4 : 3: Scales the input signal to fit 4:3 sources in the center of the screen.

LETBOX (Letterbox): For viewing non-anamorphic ("full-screen") DVDs on a 16:9 screen.

V-WIDE (VirtualWide): Enlarges a 4:3 image horizontally in a non-linear fashion to fit a 16:9 full screen display.

CINEMA: For viewing 2.35:1 source material.

V-CINE (Virtual Cinema): Selects the Virtual Cinema aspect ratio, used for viewing 16:9 source material on a 2.35:1 screen.



Note

For more information about aspect ratios, refer to Table 4-1.

4. **Cursor Keys (▲, ◀, ▼, ▶)**
Use these buttons to select items or settings, adjust settings or switch display patterns.

ENTER

Press to select a highlighted menu item or confirm a changed setting.

5. **MENU**
Press this button to show or hide the OSD controls.
6. **Aspect Ratio Selection Button**
Press this button repeatedly to select an aspect ratio.
7. **Source Selection Buttons (1-5):**

Press to select a video source. These buttons are assigned as follows: 1 = HDMI 1; 2 = HDMI 2; 3 = Component 1; 4 = Component 2; 5 = RGB.

8. **Contrast** 
Press to adjust white level.

9. **Brightness** 

Press to adjust black level.

10. **Memory Preset Buttons:**

ISF NIGHT

Press to recall settings for the current input from the “ISF Night” memory preset.

ISF DAY

Press to recall settings for the current input from the “ISF Day” memory preset.

CUST 1

Press to recall settings for the current input from the “Custom 1” memory preset.

CUST 2

Press to recall settings for the current input from the “Custom 2” memory preset.

11. **3D Mode Selection Buttons:**

3D AUTO

Press to set the 3D Mode to **Auto**.

3D SBS (Side-by-Side)

Press to set the 3D Mode to **3D Side-by-Side**.

3D TAB (Top-and-Bottom)

Press to set the 3D Mode to **3D Top-and-Bottom**.



Note

*For more information about 3D modes, refer to **3D Mode** on page 58.*

12. **LIGHT**

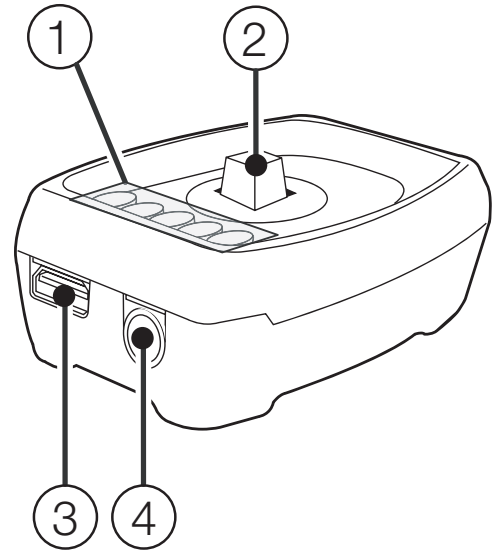
Press momentarily to activate remote backlighting.

2.5 X-200i Active 3D Emitter

The Active 3D Emitter, shown below, receives a left/right synchronization signal from the projector and transmits it to the Active 3D Glasses worn by the viewers. This signal precisely controls when left and right fields are visible through the glasses.

The Active 3D Emitter has the following functional components:

1. **LED Indicators**
Five (5), multi-colored LEDs indicate modes of operation. During normal operation, all five LEDs are off.
2. **Joystick**
Use this to enable various modes and change settings.
3. **USB Port**
A USB "Micro B" port for connecting to a PC to perform software upgrades.
4. **3D SYNC IN**
Connect the **3D SYNC** output from the projector (see Figure 2-2) to this input, using the supplied cable.

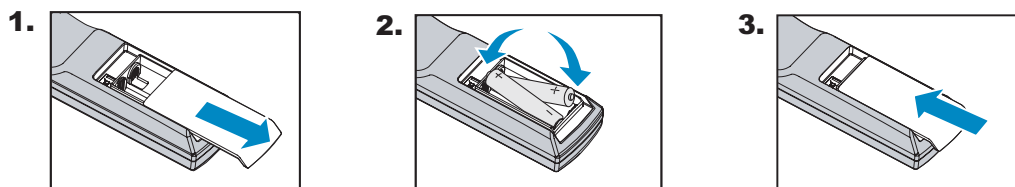


For more information configuring the emitter to work with the 3D glasses, refer to **Using the 3D Glasses** on page 73.

3. Installation

To install batteries in the remote control:

1. Slide the battery compartment cover in the direction of the arrow to remove it.
2. Install two AA batteries with the correct polarity.
3. Replace the cover.



- Make sure that the battery polarities are correct when installing the batteries.
- Do not mix an old battery with a new one or different types of batteries.
- If you will not use the remote control for a long time, remove the batteries to avoid damage from battery leakage.
- Do not expose batteries to excessive heat such as from sunshine, fire or the like.
- In most situations, you can simply point the remote control at the screen which will reflect the IR signal from the remote back toward the IR receiver on the projector. In some cases, however, ambient conditions may prevent this. If so, point the remote control at the projector and try again.
- If the effective range of the remote control decreases, or it stops working, replace the batteries with new ones.
- The remote control may fail to operate if the infrared remote sensor is exposed to bright sunlight or fluorescent lighting.
- During 3D operation, the remote control response may be adversely affected by interference from the Active 3D Emitter. It may help to point the remote directly at the projector during 3D operation. In some cases, it may be better to use the projector keypad when viewing 3D content.

3.1 Remote Control

◀ Notes on Batteries

◀ Notes on Remote Control Operation

- The projector's front IR receivers have a range of approximately 40 feet (12.19 meters). Figure 3-1 shows the reception angles of the IR receivers.

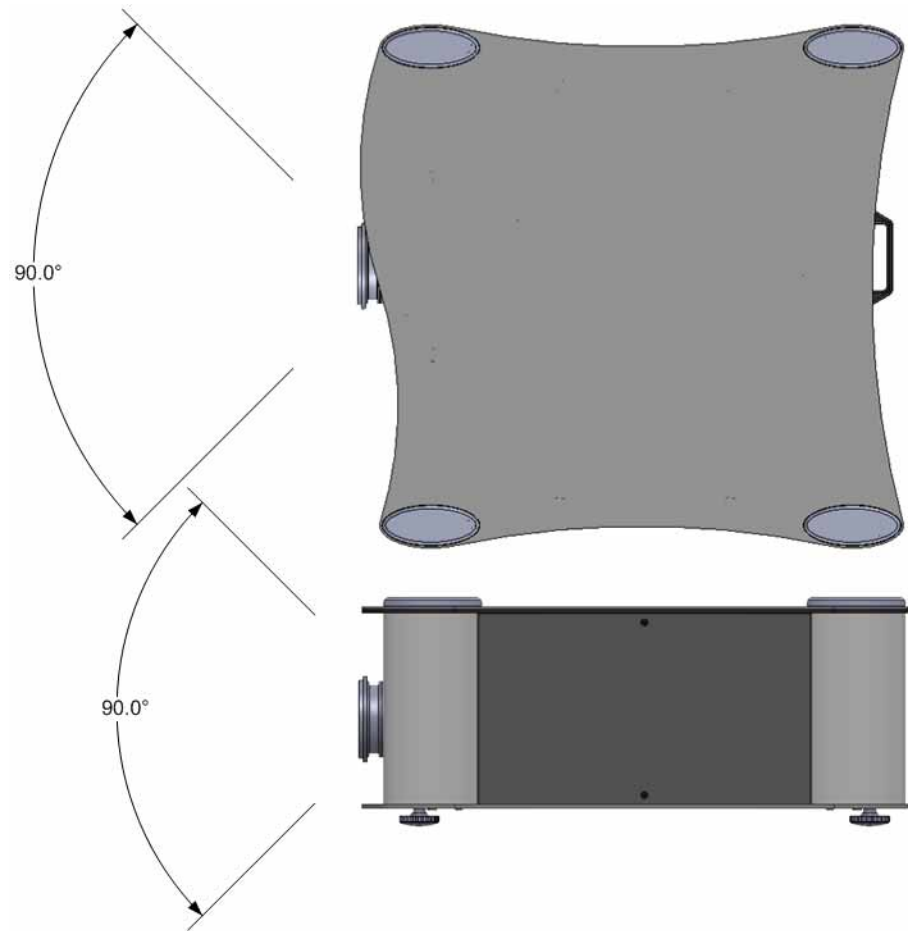


Figure 3-1. IR Reception Angles

Table 3-1 gives a quick overview of the X-200i installation process. The sections following this one provide detailed instructions.

3.2 Quick Setup



Note

Installation **must** be performed by a qualified custom video installation specialist.

Table 3-1. Installation Overview

Step	Procedure	For Details, Refer to page...
1	Choose a location for the projector	16
2	Install CineWide lens mounting assembly (stationary base plate or AutoScope lens motor – optional)	23
3	Mount the projector	28
4	Connect signal sources to the X-200i	30
5	Connect external controller to RS-232 port; connect IR repeater system to wired remote input (optional)	33
6	Connect 12-volt trigger output to retractable screen or other, +12V trigger-activated equipment (optional)	34
7	Connect the Active 3D Emitter to the projector	35
8	Apply power to the projector	35
9	Primary lens adjustments: projected image size (zoom), position (shift) and focus	19, 37
10	Change the OSD Language (optional)	38
11	For rear-screen and/or ceiling-mount installations, select the proper picture orientation	39
12	Install and adjust secondary anamorphic lens (optional)	39
13	Projector calibration: adjust the following for each input ; save settings when finished: <ul style="list-style-type: none"> • Aspect ratio • Brightness • Contrast • Color level • Tint • Input position 	52
14	Prepare Active 3D Glasses for use and test with 3D source material	73

3.3 Installation Considerations

Proper installation of your projector will ensure the quality of your display. Whether you are installing a projector temporarily or permanently, you should take the following into account to ensure your projector performs optimally.

Installation Type ➤ Choose the installation type that best suits your needs: front or rear screen, floor mount or inverted mount. Table 3-2 compares these various installation methods.

Table 3-2. Projector Installation Options

Advantages	Considerations
Front Screen, Floor Mount Installation	
<ul style="list-style-type: none"> • Easy to set up • Can be moved or changed quickly • Easy to access 	<ul style="list-style-type: none"> • Shares floor space with audience
Front Screen, Inverted Mount (ceiling) Installation	
<ul style="list-style-type: none"> • Does not take up audience space • Projector is unobtrusive • Projector cannot be accidentally moved 	<ul style="list-style-type: none"> • Installation is more permanent • Projector access is more difficult
Rear Screen, Floor Mount Installation	
<ul style="list-style-type: none"> • Projector is completely hidden • Projector is easily accessed • Usually good ambient light rejection 	<ul style="list-style-type: none"> • Requires separate room • Installation cost is usually higher
Rear Screen, Inverted Mount (ceiling) Installation	
<ul style="list-style-type: none"> • Projector is completely hidden • Usually good ambient light rejection 	<ul style="list-style-type: none"> • Requires separate room • Installation cost is usually higher
Rear Screen, Floor Mount with Mirror	
<ul style="list-style-type: none"> • Projector is completely hidden • Usually good ambient light rejection • Requires less space behind screen than other rear screen installations 	<ul style="list-style-type: none"> • Requires separate room • Installation cost is usually higher

In general, minimize or eliminate light sources directed at the screen. Contrast ratio in your images will be noticeably reduced if light directly strikes the screen, such as when a shaft of light from a window or floodlight falls on the image. Images may then appear washed out and less vibrant.

◀ **Ambient Light**

Throw distance is the distance measured from the front of the projector to the screen. This is an important calculation in any projector installation as it determines whether or not you have enough room to install your projector with a desired screen size and if your image will be the right size for your screen.

◀ **Throw Distance**

You can quickly estimate the throw distance by taking the width of the screen and multiplying it by the lens throw ratio; see Figure 3-2. The result of this calculation tells you roughly how far back the projector should be positioned from the screen in order to project a focused image large enough to fill the screen.

Estimating Throw Distance

Throw Distance (TD) =
Screen Width (w) × Lens Throw Ratio

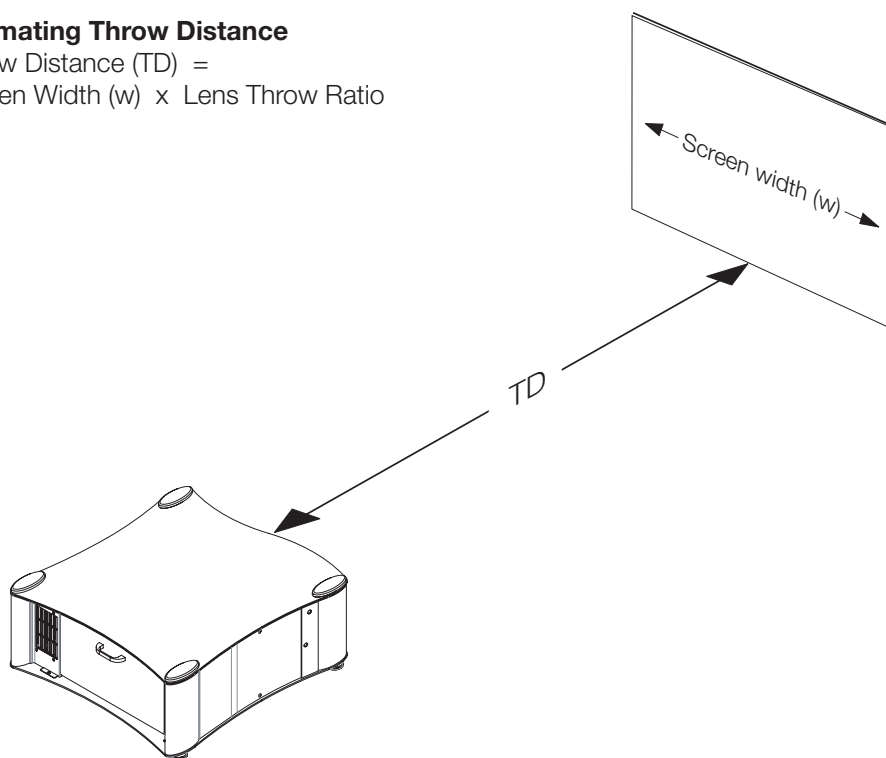


Figure 3-2. Estimating Throw Distance

Table 3-3 lists the available X-200i Series lens options and their associated throw ratios.

Table 3-3. X-200i Lens Options and Throw Ratios (Note)

Projector Model	Throw Ratio with Primary Lens Only	Throw Range in inches, with 108 x 60.75-inch (1.78:1) Screen		Throw Ratio with Primary Lens and Anamorphic Lens	Throw Range in inches, with 144 x 60.75-inch (2.35:1) Screen	
		Minimum	Maximum		Minimum	Maximum
X-200i + Standard Lens	1.85 – 2.40	199.80	259.20		(n/a)	
X-200i/CineWide (Whitney Lens)		(n/a)		1.85 – 2.40	266.40	345.60
X-200i/CineWide (McKinley Lens)		(n/a)		1.39 – 1.80	200.16	259.20
X-200i/CineWide with AutoScope + Standard Lens	1.85 - 2.40	199.80	259.20	1.39 – 1.80	200.16	259.20
X-200i + Short-Throw Primary Lens	1.56 - 1.86	168.48	200.88		(n/a)	
X-200i/CineWide (McKinley Lens) + Short-Throw Primary Lens		(n/a)		1.17 - 1.39	168.48	200.16
X-200i/CineWide with AutoScope + Short-Throw Primary Lens	1.56 - 1.86	168.48	200.88	1.17 - 1.39	168.48	200.16
X-200i + Long-Throw Primary Lens	2.40 – 4.00	259.20	432.00		(n/a)	
X-200i/CineWide (McKinley Lens) + Long-Throw Primary Lens		(n/a)		1.80 – 3.00	259.20	432.00
X-200i/CineWide with AutoScope + Long-Throw Primary Lens	2.40 – 4.00	259.20	432.00	1.80 – 3.00	259.20	432.00

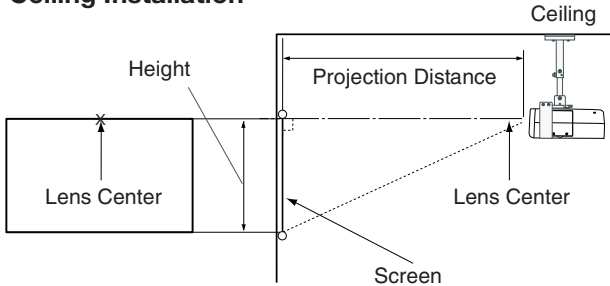
Note: Due to normal manufacturing variances, throw distance can vary by up to +/- 5 percent from these specifications.

Proper placement of the projector relative to the screen will yield a rectangular, perfectly-centered image that completely fills the screen.

◀ **Vertical and Horizontal Position**

Ideally, the projector should be positioned perpendicular to the screen and in such a way that the lens center is aligned with either the top or bottom edge of the screen area, and centered horizontally. See Figure 3-3.

Ceiling Installation



Floor Installation

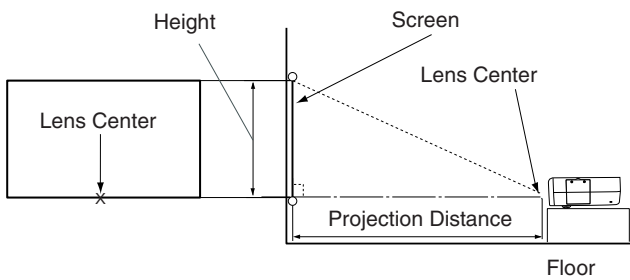
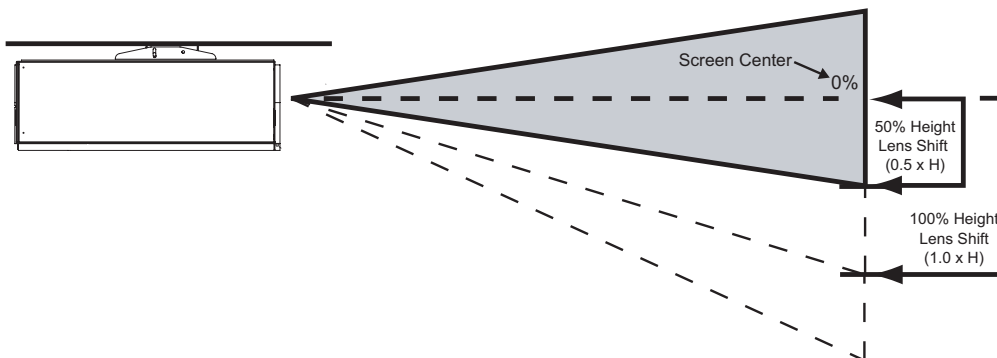


Figure 3-3. Projector Placement

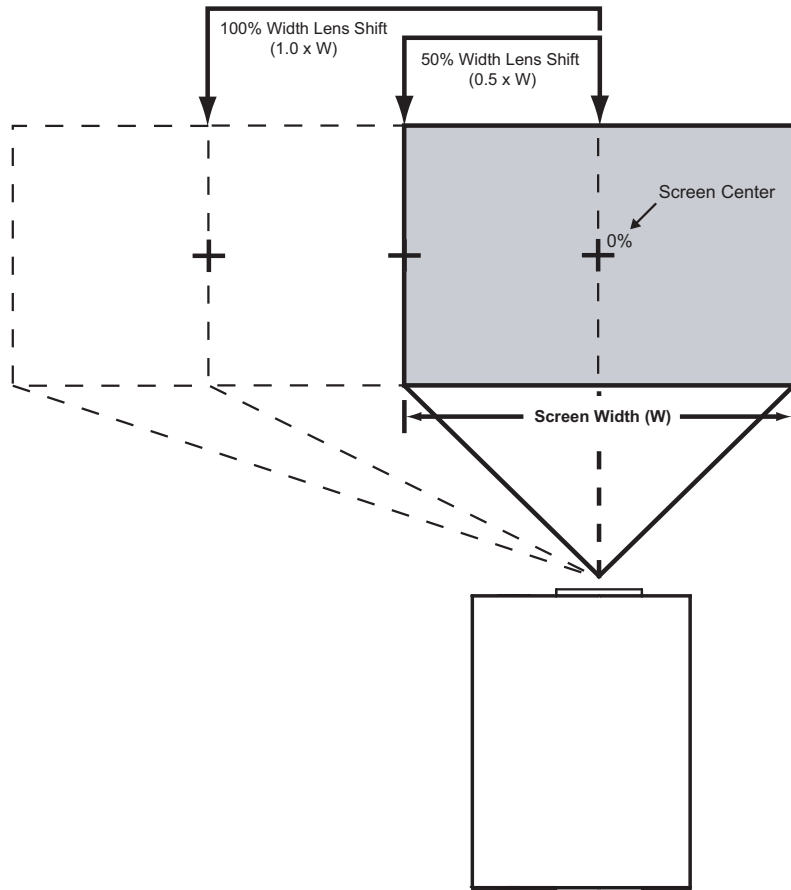
You can use the lens shift controls on the projector to center the image on the screen. Lens shift is generally expressed as a percentage of the screen height or width, as shown in Figure 3-4 and Figure 3-5.

◀ **Lens Shift**



Note: This is a general example of lens shift. Lenses vary in their shift capabilities. **No particular lens or projector is used in this example.**

Figure 3-4. Vertical Lens Shift (Example Only)



Note: This is a general example of lens shift. Lenses vary in their shift capabilities. **No particular lens or projector is used in this example.**

Figure 3-5. Horizontal Lens Shift (Example Only)

Table 3-4 lists the lens shift limits for each available X-200i lens, as percentages and absolute measurements with a 100 x 56 inch (1.78:1) screen.

Table 3-4. Vertical and Horizontal Lens Shift Limits

		Primary Lens Option	
		Standard or Short-Throw Lens	Long-Throw Lens
Lens Shift Limits, as Percentages of Screen Height or Width (Note 1)			
Vertical (Note 2)	Up	25%	25%
	Down	60%	35%
Horizontal	Left	15%	7.5%
	Right	15%	7.5%
Lens Shift Limits in Inches, with a 100-by-56 inch (1.78:1) Screen			
Vertical (Note 2)	Up	14.00	14.00
	Down	33.60	19.60
Horizontal	Left	15.00	7.50
	Right	15.00	7.50
Notes:			
1. Vertical shift limits are percentages of the screen height. Horizontal shift limits are percentages of the screen width.			
2. Vertical lens shift figures are for ceiling mount configurations. For floor installations (where the projector is upright), reverse the up/down vertical lens shift percentages.			

Folded Optics ➤ In rear-screen applications where space behind the projector is limited, a mirror may be used to fold the optical path, as shown in Figure 3-6. The position of the projector and mirror must be accurately set. If you are considering this type of installation, contact your dealer for assistance.

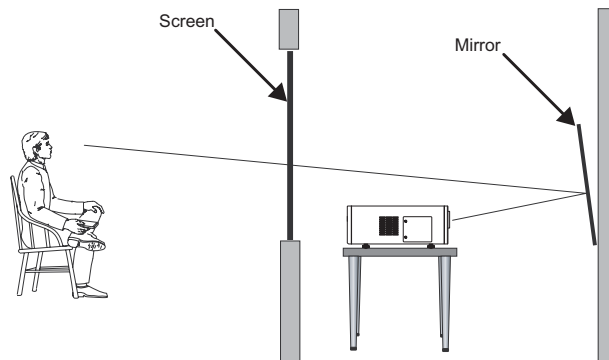


Figure 3-6. Folded Optics



Tip

For best performance, always use “first-surface” mirrors in your rear-projection installation (as opposed to conventional, “second-surface” mirrors with the reflective surface behind a transparent substrate such as glass or acrylic).

First-surface mirrors provide a strict reflection without the “ghosting” effect seen with a second surface mirror, where a faint secondary reflection could be observed coming from the front surface of the glass.

This is especially critical for 3D viewing; with a conventional second-surface mirror, the resulting image quality may be unacceptable.

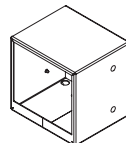
- Other Considerations** ➤ Other considerations and tips that can help improve your installation:
- Keep the ambient temperature constant and below 35°C (95°F). Keep the projector away from heating and/or air conditioning vents. Changes in temperature may cause drifts in the projector circuitry, which may affect performance.
 - Keep the projector away from devices that radiate electromagnetic energy such as motors and transformers. Common sources of these include slide projectors, speakers, power amplifiers and elevators.

If you are installing a standard (non-CineWide) X-200i, skip this step and proceed with **Mounting the X-200i** (page 28).

If you are installing an X-200i/CineWide with a “McKinley” (cylindrical) anamorphic lens, proceed with **Installing the Fixed CineWide Base Plate (Cylindrical Anamorphic Lens)** (page 27).



If you are installing an X-200i/CineWide with a “Whitney” (prismatic) anamorphic lens, proceed with **Installing the Fixed CineWide Base Plate (Prismatic Anamorphic Lens)** (page 26).



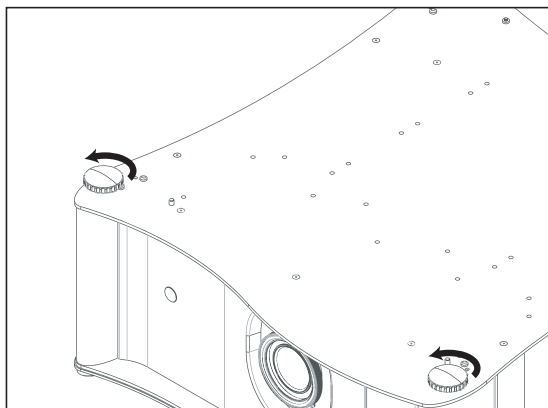
If you are installing an X-200i/CineWide with AutoScope, proceed as follows to install the AutoScope lens motor.



Note

1. Do not install the CineWide lens yet, only the fixed CineWide base plate or AutoScope lens motor. You will install the CineWide lens after you install the projector and adjust the primary lens.
2. Some components shipped with your projector may differ slightly from what is shown in these instructions.

Remove Projector Feet: Place the projector upside down on a blanket or other soft surface. Loosen and remove the two front feet on the projector.



3.4 Installing the Optional CineWide Lens Mount

Installing the Lens Motor ➤
(X-200i/CineWide with
AutoScope)

Figure 3-7 shows the X-200i/CineWide with AutoScope motor assembly.

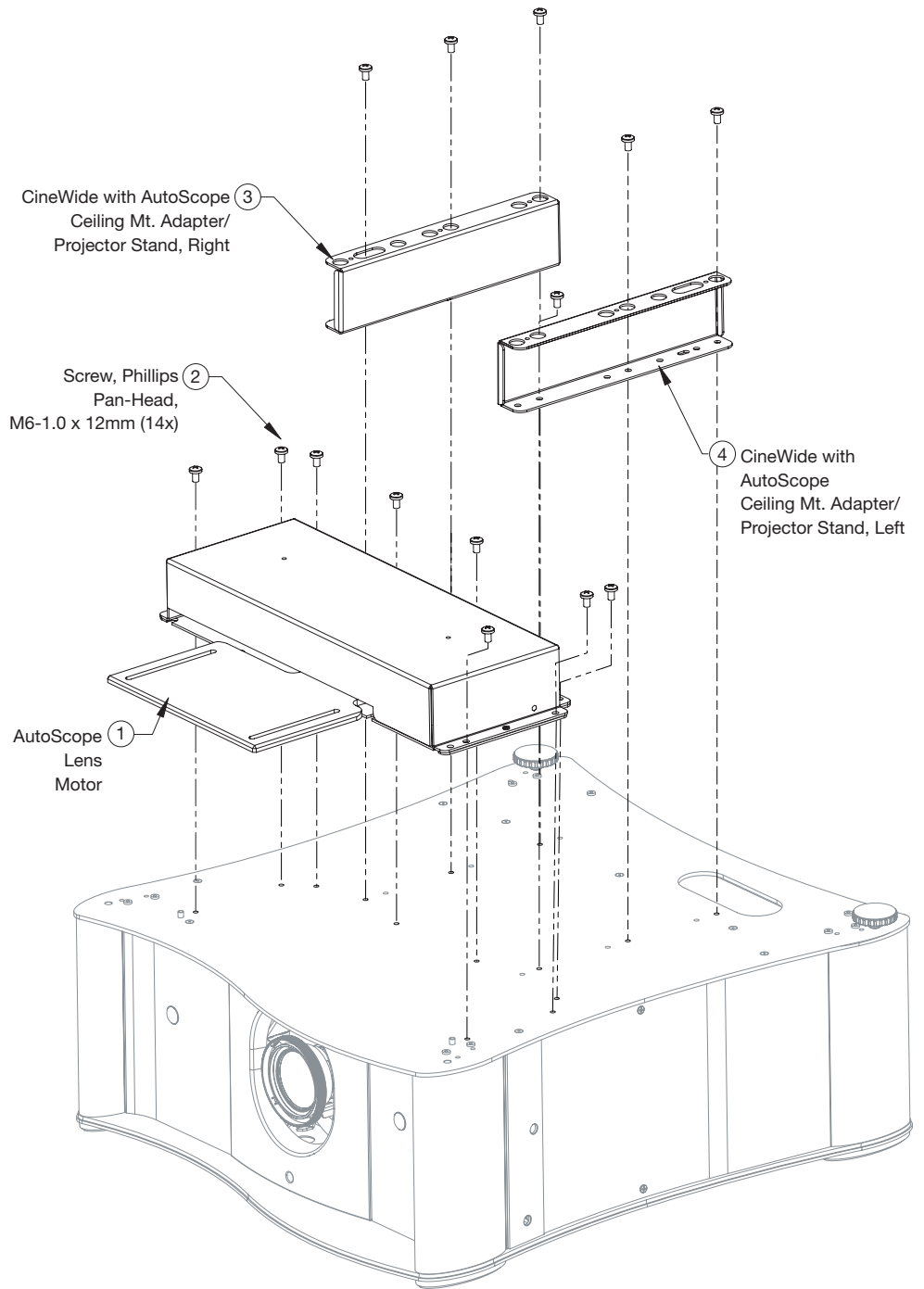


Figure 3-7. X-200i/CineWide with AutoScope Motor Assembly – Exploded View

Install Lens Motor:

1. Position the AutoScope lens motor as shown in Figure 3-7.
2. Line up the mounting holes on the lens motor housing with those on the underside of the projector.
3. Secure the motor to the projector with the eight (8) supplied M6 x 12mm Pan-Head Phillips screws.

Install Ceiling Mount Adapters/Projector Stands: For ceiling installations, the adapters bring the attachment points for the projector mounting rails (included with the projector ceiling mount kit) from the bottom of the projector above and behind the AutoScope lens motor housing. For floor installations (where the projector is upright), the adapters allow the projector to lie flat on the mounting surface.

Using six (6) each of the supplied, Pan-Head Phillips screws, attach the AutoScope Ceiling Mount Adapters/Projector Stands to the projector as shown in Figure 3-7.



Caution

DO NOT OVER-TIGHTEN THE SCREWS.

Connecting the AutoScope Lens Motor to the Projector: Connect the AutoScope lens transport motor to a 12-volt trigger output on the projector, as shown in Figure 3-8.

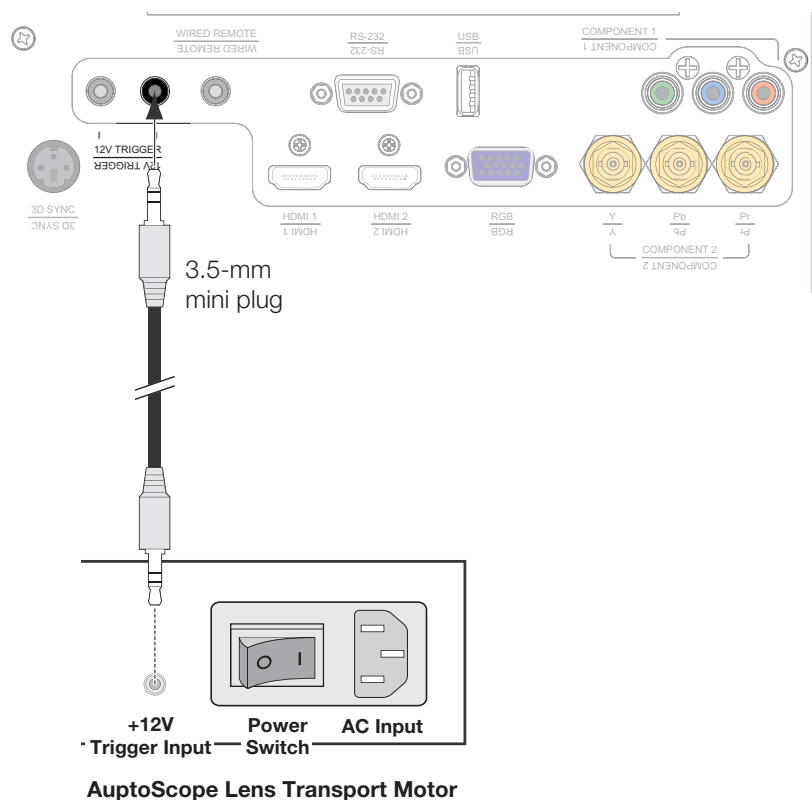


Figure 3-8. Connecting the AutoScope Lens Transport Motor to the Projector

After you have installed the AutoScope lens motor, proceed with **Mounting the X-200i** (page 28).

**Installing the Fixed
CineWide Base Plate
(Prismatic Anamorphic
Lens)**

To install the fixed CineWide base plate on a X-200i/CineWide with a **prismatic** anamorphic lens:

1. Place the projector upside down on a blanket or other soft surface.
2. Secure the CineWide base plate and Ceiling Mount Plate (if used) to the projector with the three, M4 x 0.7 x 14mm screws provided with the CineWide lens base plate. See Figure 3-9.



Caution

DO NOT OVER-TIGHTEN THE SCREWS.

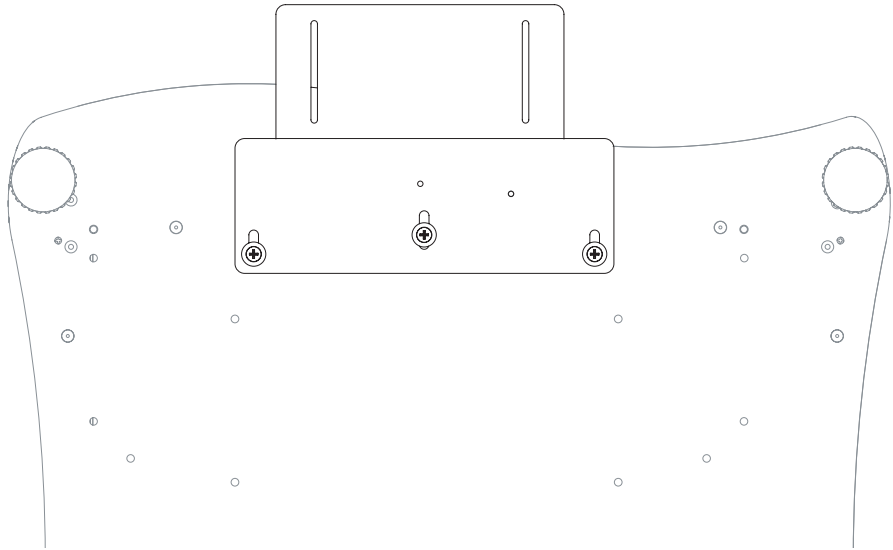


Figure 3-9. Projector with Whitney (Prismatic) Lens Base Plate - Bottom View

To install the fixed CineWide base plate on a X-200i/CineWide with a **cylindrical** anamorphic lens:

1. Place the projector upside down on a blanket or other soft surface.
2. Place the CineWide base plate on the bottom of the projector.
3. **If you are mounting the projector on a ceiling:** Line up the three holes on the left and right mounting rails (included with the projector ceiling mount kit) with those on the bottom of the projector and CineWide base plate.
4. Secure the CineWide base plate (and ceiling mounting rails, if needed) to the projector with the Pan-Head Phillips screws provided with the CineWide lens base plate. See Figure 3-10.

◀ **Installing the Fixed CineWide Base Plate (Cylindrical Anamorphic Lens)**



Caution

1. **Do not use the mounting screws provided with the ceiling mounting kit.** Use only the hardware provided with the CineWide lens base plate.

2. **DO NOT OVER-TIGHTEN THE SCREWS.**

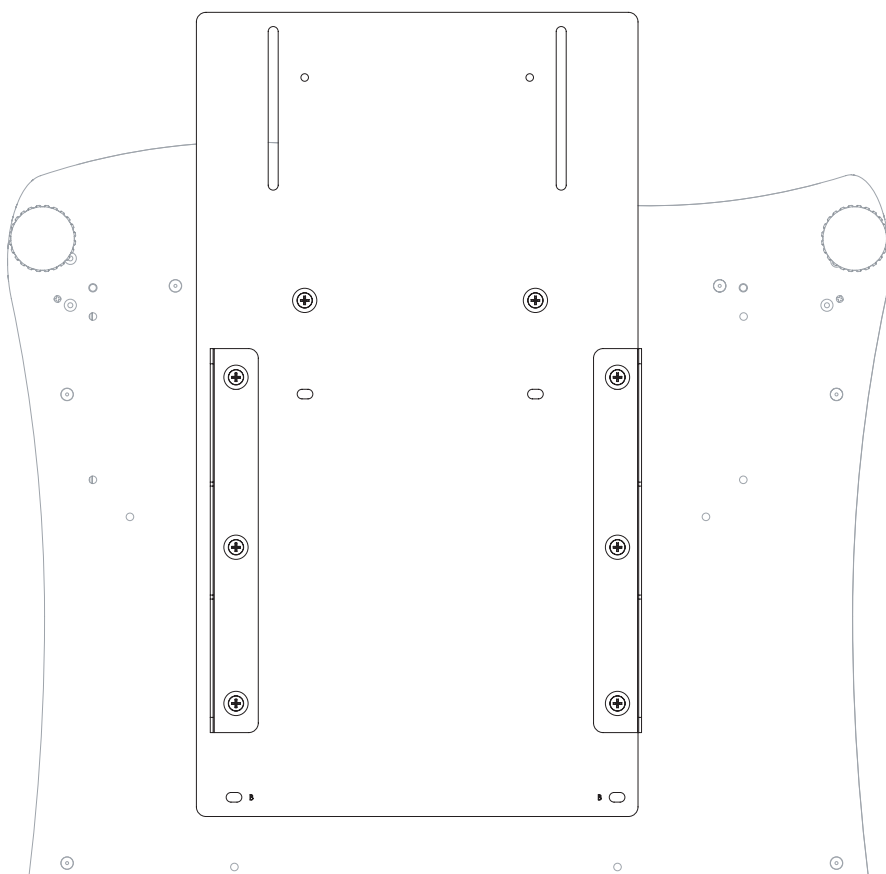


Figure 3-10. X-200i/CineWide with McKinley (Cylindrical) Lens Base Plate and Ceiling Mounting Rails - Bottom View

3.5 Mounting the X-200i

There are several methods for mounting the projector. Depending on your chosen installation, one method may be more suitable than another.

Floor Mounting (Upright) ➤

In typical front and rear screen installations, the projector can be mounted to a secure and level surface such as a table or cart. Carts are useful when moving a projector during a presentation or from site to site. If possible, lock the wheels when it's in position to prevent it from being moved during a presentation.

Ceiling Mounting (Inverted) ➤

For fixed installations, and for those that want the projector out of sight or have a limited space for projector and audience, you can invert the X-200i and suspend it from the ceiling using a specially-designed ceiling mount fixture.

For detailed installation instructions, refer to the documentation provided with the ceiling mount kit.

Adjusting the Projection Angle ➤

If the screen is significantly higher or lower than the projector, you can also tilt the projector at a slight angle. In a ceiling installation, you do this by adjusting the ceiling mount.

For a floor installation, turn the adjustable feet at the bottom of the projector to adjust the projection angle.

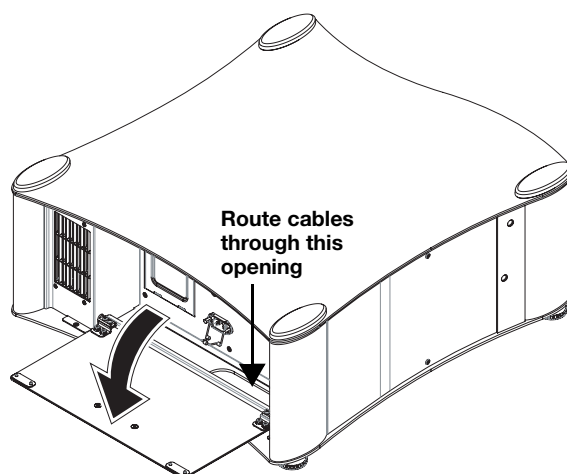
If you do this, you may need to vertically shift the image to compensate. For detailed instructions, refer to ***Lens Adjustments*** on page 37.

Proceed as follows to connect the X-200i to your video sources, external controller(s) – if present – and AC power.

When connecting your equipment:

- Turn off all equipment before making any connections.
- Use the correct signal cables for each source.
- For best performance and to minimize cable clutter, use high-quality cables that are only as long as necessary to connect two devices. (Don't use a 20-foot cable when a 6-foot cable will suffice.)
- Route all cables through the opening at the bottom of the projector.
- Ensure that the cables are securely connected. Tighten the thumbscrews on connectors that have them.

To access the connector panel, open the rear door by grasping the handle and pulling it down and toward you.



3.6 Connections to the X-200i

◀ Connector Panel Access

Connecting Source Components to the X-200i

Connect your video sources to the X-200i as shown and described in the sections that follow.

HDMI/DVI Connections: See Figure 3-11.



Tip

Use the HDMI inputs whenever possible. This ensures the highest video quality because the signal is carried in the digital domain throughout the entire signal path, from source component output into the projector.

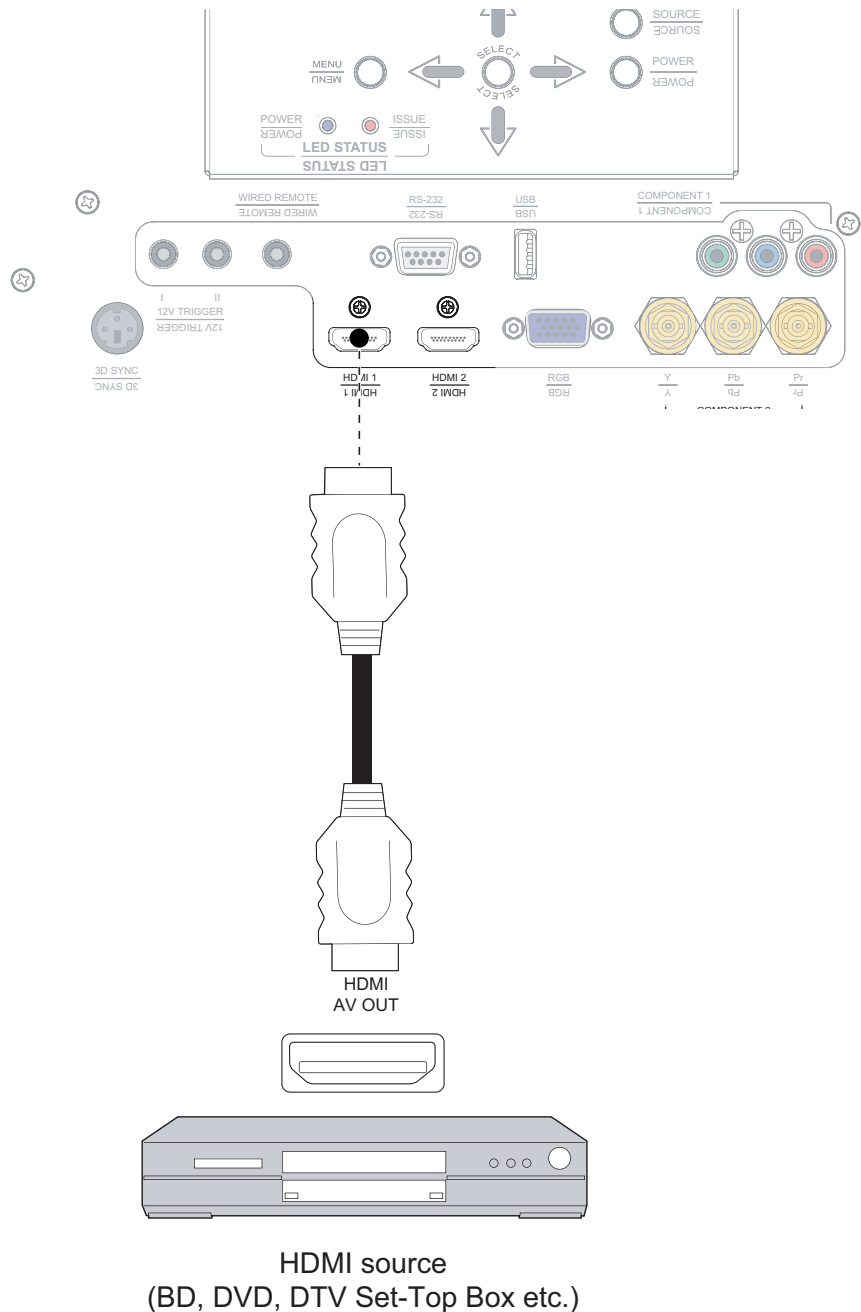


Figure 3-11. HDMI/DVI Source Connections

RGB Connection: Connect your personal computer or other RGB source to the **RGB** input. See Figure 3-12.

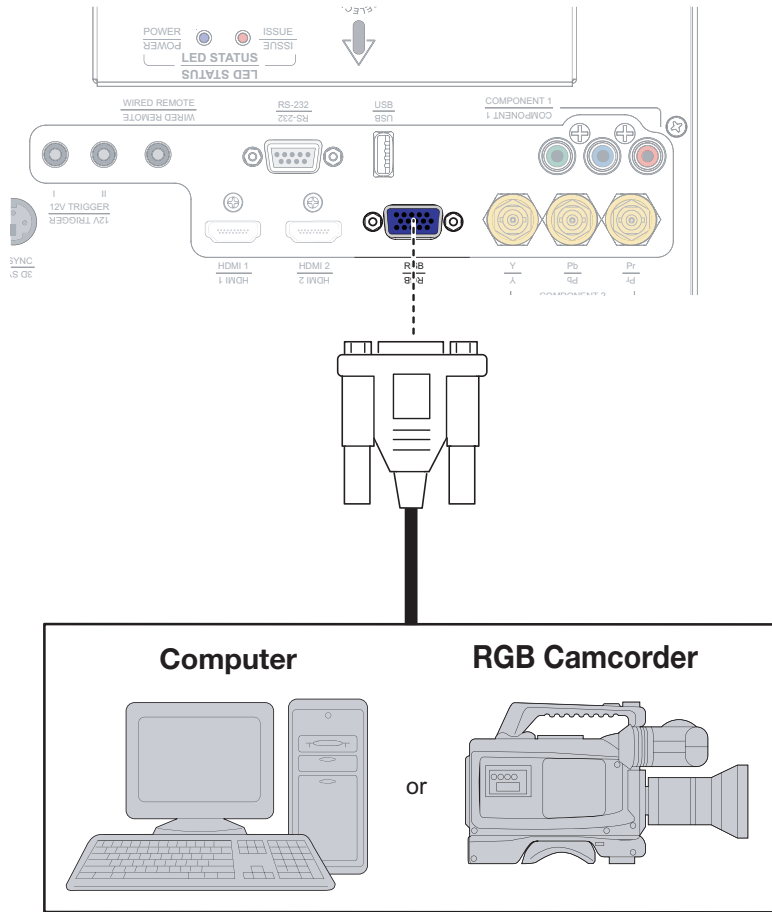


Figure 3-12. RGB Connection

Component Video Connections: Connect your component video sources to the **COMPONENT 1**, **COMPONENT 2** or **RGB** inputs as shown in Figure 3-13.

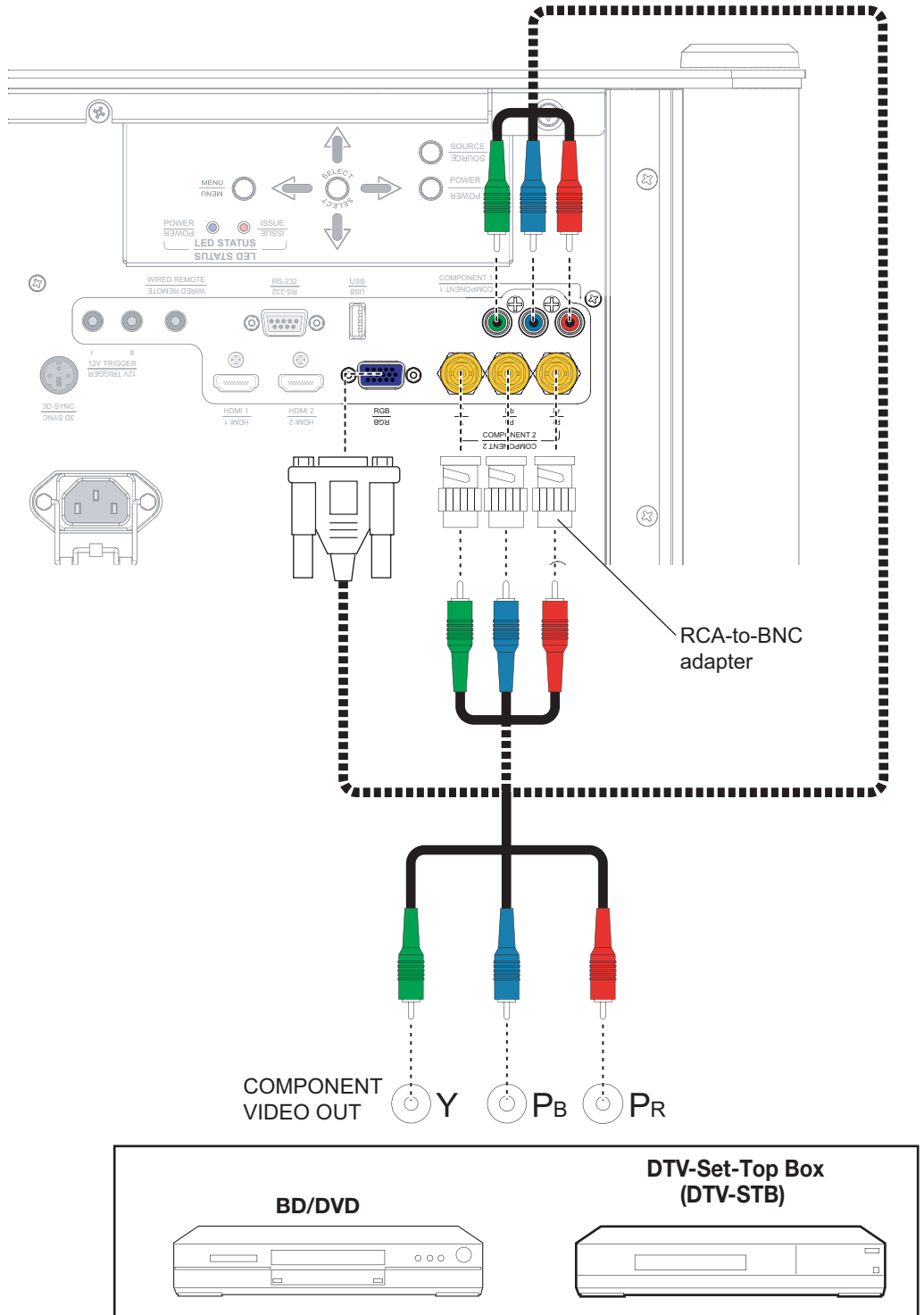


Figure 3-13. Component Video Connections

Connect a PC or home theater control/automation system (if present) to the RS-232 port on the X-200i; see Figure 3-14. Use a standard, 9-pin serial cable, wired straight-through. For more information about using this connection, refer to **External Control** on page 81.

◀ **RS-232 Controller Connection**

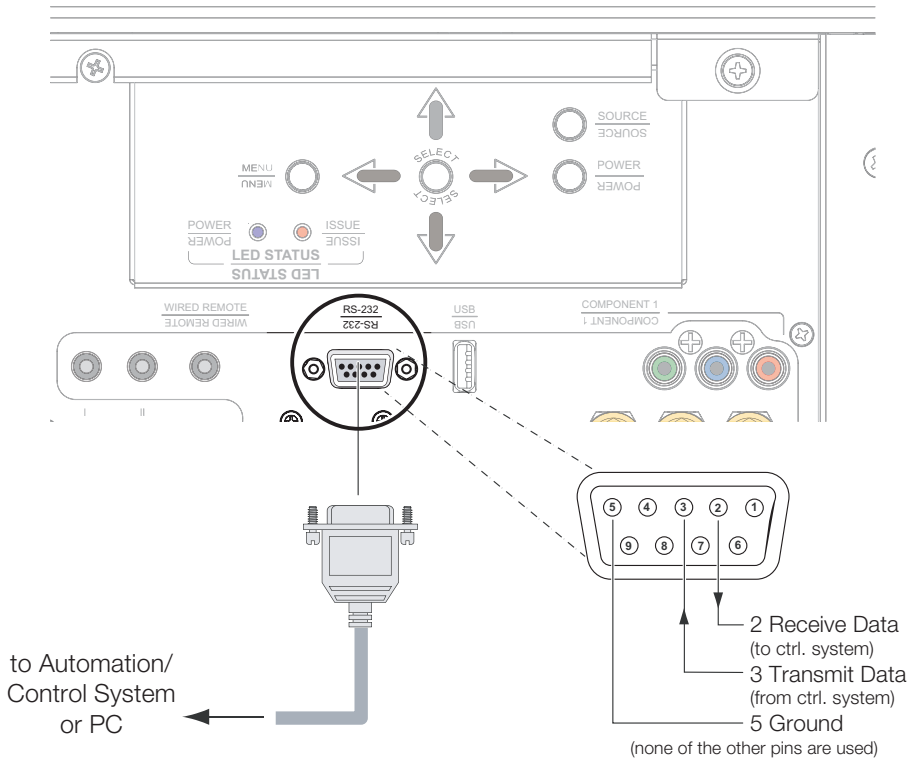


Figure 3-14. RS-232 Control System Connection

Connecting an External IR Receiver to the Projector

If infrared signals from the remote control cannot reach the projector due to excessive distance or obstructions such as walls or cabinet doors, you can connect an external IR receiver to extend the range of the remote control. See Figure 3-15.

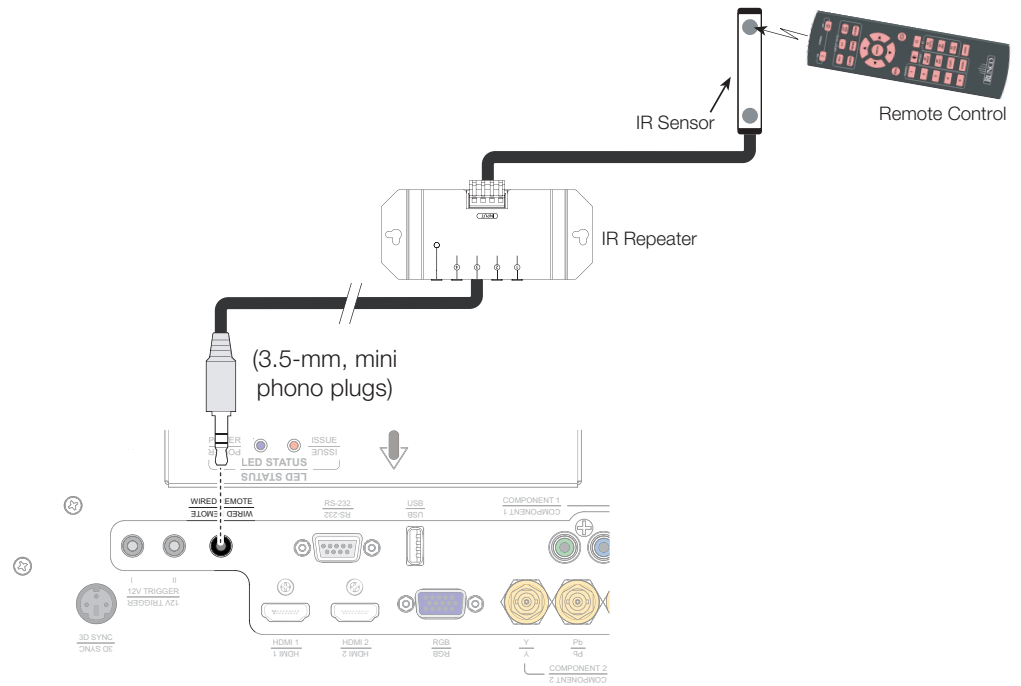


Figure 3-15. External IR Receiver Connection

Connecting 12-Volt Trigger Output to External Theater Equipment

If you are installing an X-200i/CineWide with AutoScope, connect the AutoScope lens motor to a 12-volt trigger output on the X-200i as shown in Figure 3-8.

Similarly connect other 12-volt trigger-activated equipment (such as retractable screens or screen masks) to the other trigger output; see Figure 3-16.

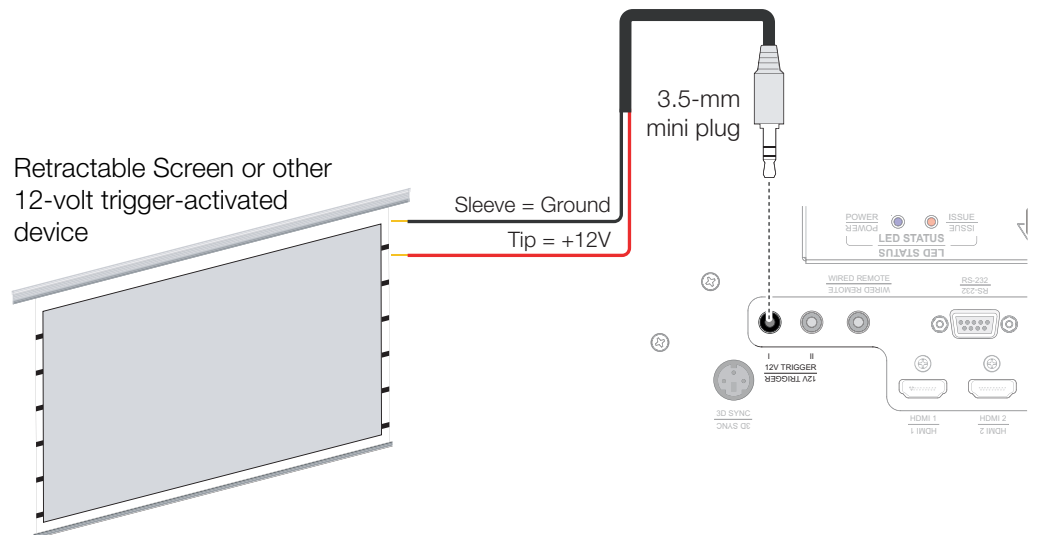


Figure 3-16. 12-Volt Trigger Output Connection

Connect the **3D SYNC IN** port on the emitter to the **3D SYNC** connector on the projector, as shown in Figure 3-17.

◀ Connecting the Active 3D Emitter to the Projector



Tip

Secure the emitter in the desired location using double-sided tape or a similar adhesive material.

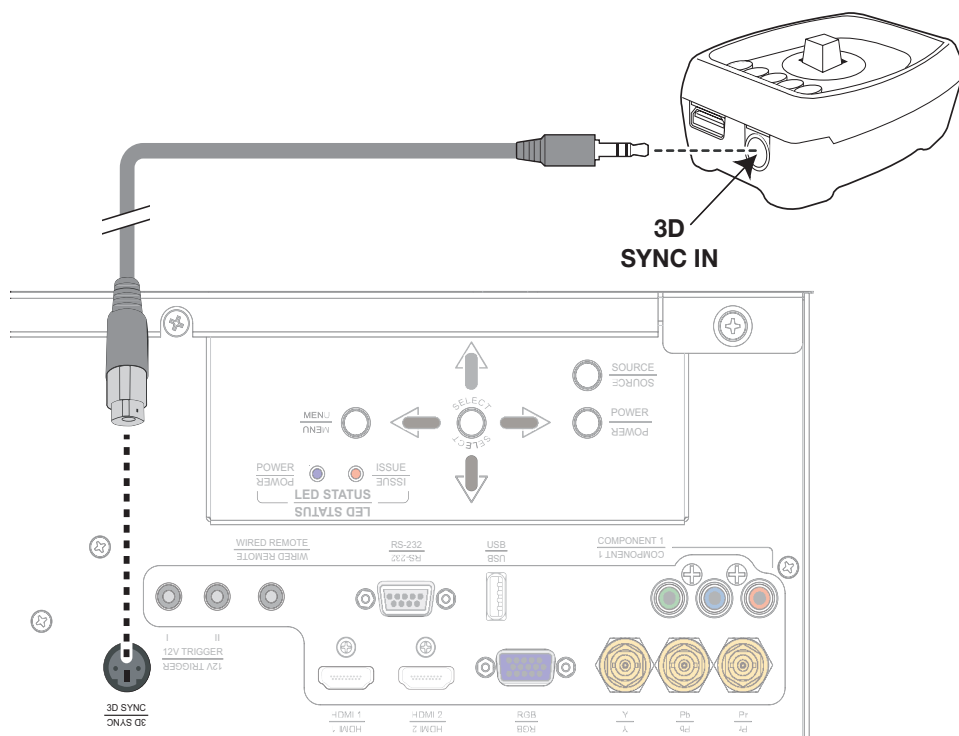


Figure 3-17. Active 3D Emitter Connection


Projector: The X-200i ships with various types of AC power cords. Choose the one that is appropriate to your locale.

◀ Connecting to AC Power

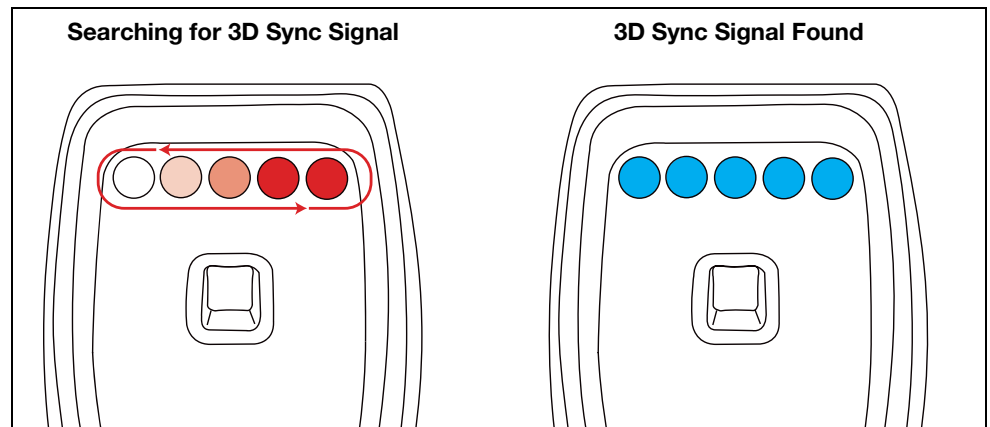
Plug the female end of the power cord into the AC receptacle on the rear of the projector (AC 100V ~ 240V); see Figure 2-2. Then, connect the other end to your AC power source.

AutoScope Lens Motor: With AutoScope-equipped projectors, an additional power cord is provided for the lens motor. Plug the female end of the AC power cord into the AC input on the rear of the lens motor assembly. Connect the other end to your AC power source.

3.7 Turning on the Power

1. Turn on your source components.
2. Set the AutoScope lens motor power switch to the “on” position.
3. Press the **ON**  button on the remote control (or the **POWER** button on the system keypad) to turn on the X-200i. The blue **POWER** LED flashes blue to indicate that it is warming up.
4. When the projector is ready for use, the **POWER** LED turns off.
5. When the projector is turned on, the Active 3D Emitter turns on as well. The LEDs display a red moving pattern while the emitter attempts to acquire a 3D signal and until a signal is found.

If the emitter searches for a signal for longer than 60 seconds, a signal is assumed to not be present.



6. Upon finding a 3D signal, all LEDs turn blue. Once the LEDs indicate a 3D signal, the 3D glasses can be used to experience 3D. For more information on using the Active 3D Glasses, refer to **Using the 3D Glasses** on page 73.

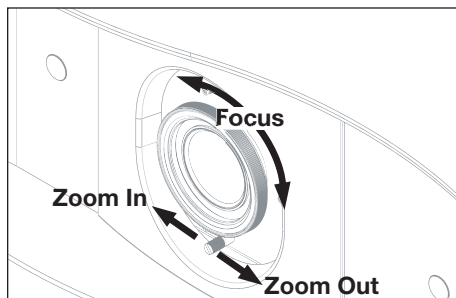
The X-200i gives you a great deal of control over the picture size, position and focus.

To focus the projected image, grasp the lens by the front ring and rotate it.

To make the picture smaller (zoom out), slide the zoom control to the right.

To make the picture larger (zoom in), slide the zoom control to the left.

To lock the position of the lens, tighten the knob with a flat-blade screwdriver.



3.8 Lens Adjustments

◀ Focus and Zoom



Caution

Do not attempt any lens adjustments when the lens lock is engaged. Doing so may cause damage to the zoom or lens shift mechanisms.



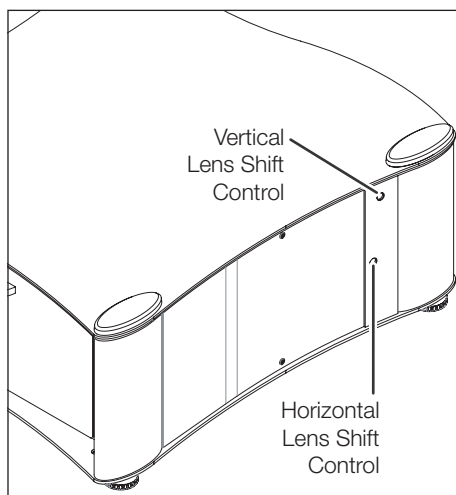
WARNING

THE LENS SHIFT MECHANISM CAN BE DAMAGED BY EXCESSIVE FORCE. Do not attempt to move the primary lens beyond its normal adjustment range.

◀ Lens Shift

Vertical Lens Shift: To shift the projected image vertically, first ensure that the lens lock is not engaged. Insert the provided hex wrench into the vertical lens shift adjuster on the side of the projector. Then, turn the wrench to shift the lens in the desired direction.

Horizontal Lens Shift: To shift the projected image horizontally, first ensure that the lens lock is not engaged. Insert the provided hex wrench into the horizontal lens shift adjuster at the top of the projector. Then, turn the wrench to shift the lens in the desired direction.

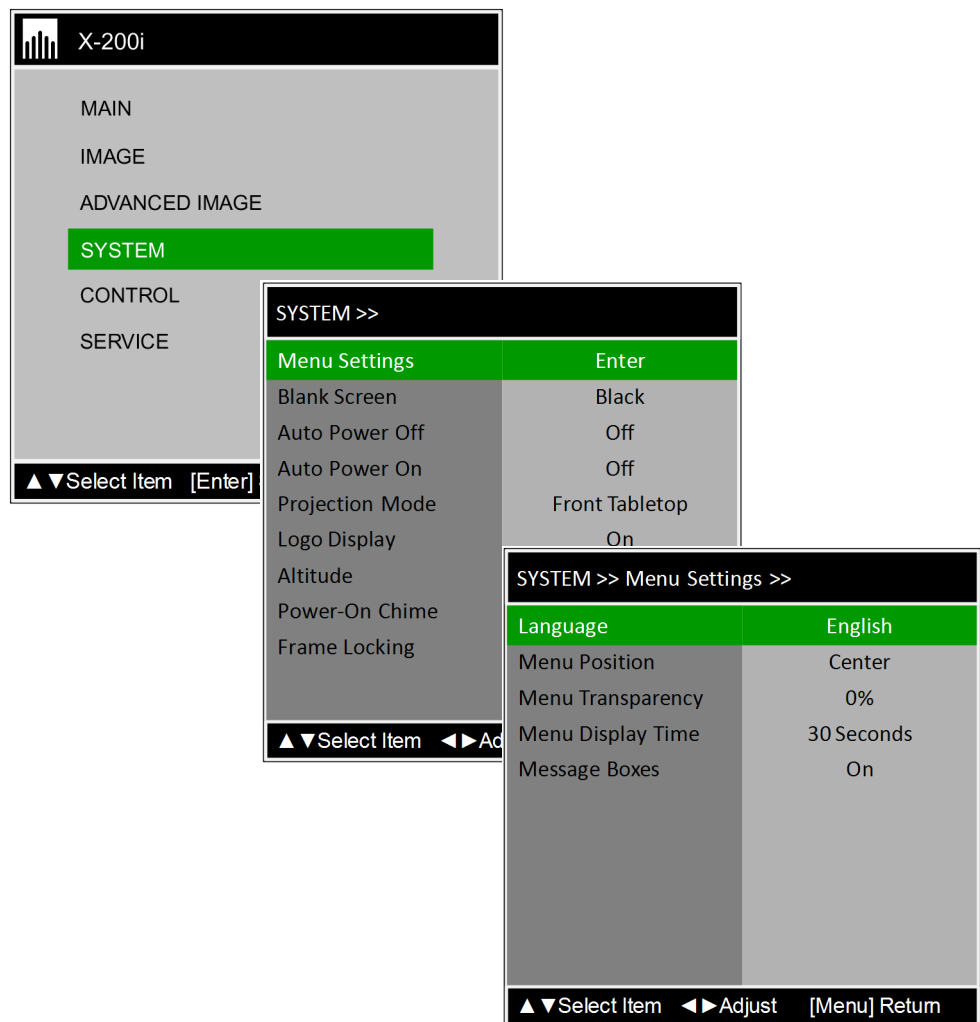


3.9 Changing the OSD Language

The X-200i can display the OSD menus in English (default), French, German, Italian, Spanish, Swedish, Simplified Chinese, Traditional Chinese, Japanese, Korean, Portuguese or Russian.

To change the OSD language:

1. Press **MENU** on the remote control unit or system keypad to display the Master menu.
2. Press **▲** or **▼** to highlight **SYSTEM**, then press **ENTER** (remote control) or **SELECT** (system keypad).
3. Press **▲** or **▼** to highlight **Menu Settings**, then press **ENTER** (remote control) or **SELECT** (system keypad).
4. Press **▲** or **▼** to highlight **Language**.
5. Press **◀** or **▶** to select a language. Then, press **MENU** repeatedly to exit the menu system.



If the X-200i is ceiling-mounted and/or installed behind the screen, you must change the picture orientation to match the installation method. To do this, press **MENU** on the remote control. Then, select **SYSTEM** from the Master Menu.

If the projector is used in a rear-projection application (see Figure 3-6), press ▼ repeatedly to select Projection Mode from the System Menu. Press ◀ or ▶ to set it to **Rear Tabletop** or **Rear Ceiling**.

If the projector is ceiling-mounted, press ▼ repeatedly to select Projection Mode from the System Menu. Press ◀ or ▶ to set it to **Front Ceiling** or **Rear Ceiling**.

If you are installing an X-200i/CineWide or X-200i/CineWide with AutoScope, proceed as follows to install and adjust the secondary anamorphic lens.



Note

It is extremely important that the primary lens is properly adjusted before you install the anamorphic lens. Ensure that the image from the primary lens is perfectly centered on the screen.

Runco offers two types of anamorphic lenses for its CineWide projectors: **prismatic** and **cylindrical**.

- The prismatic lens compresses the height of the image (as opposed to stretching the width) to achieve a 2.35:1 aspect ratio with a 1.78:1 display device.
- The cylindrical anamorphic lens has a larger aperture than the prismatic lens. It stretches the width of the image to achieve a 2.35:1 aspect ratio with a 1.78:1 display device.

The X-200i/CineWide is available with either a prismatic or a cylindrical anamorphic lens. The X-200i/CineWide with AutoScope always uses a cylindrical lens.



Note

The prismatic anamorphic lens can only be used with the standard primary lens. It is not compatible with the short-throw or long-throw primary lens.

If you are installing a CineWide projector with a prismatic lens, refer to **Whitney (Prismatic) Anamorphic Lens Installation and Adjustment** on page 45. If you are installing a CineWide projector with a cylindrical lens, continue with the next section.

3.10 Adjusting the Picture Orientation

◀ **Rear Projection**

◀ **Ceiling Mode**

3.11 Installing and Adjusting the CineWide Anamorphic Lens

Cylindrical Anamorphic Lens Installation and Adjustment

The Cylindrical Anamorphic lens mount kit consists of everything shown in Figure 3-18. Some components shipped with your projector may differ slightly from what is shown in these instructions. If any items are missing or damaged, please contact your Runco dealer or Runco Customer Service at (800) 23-RUNCO.

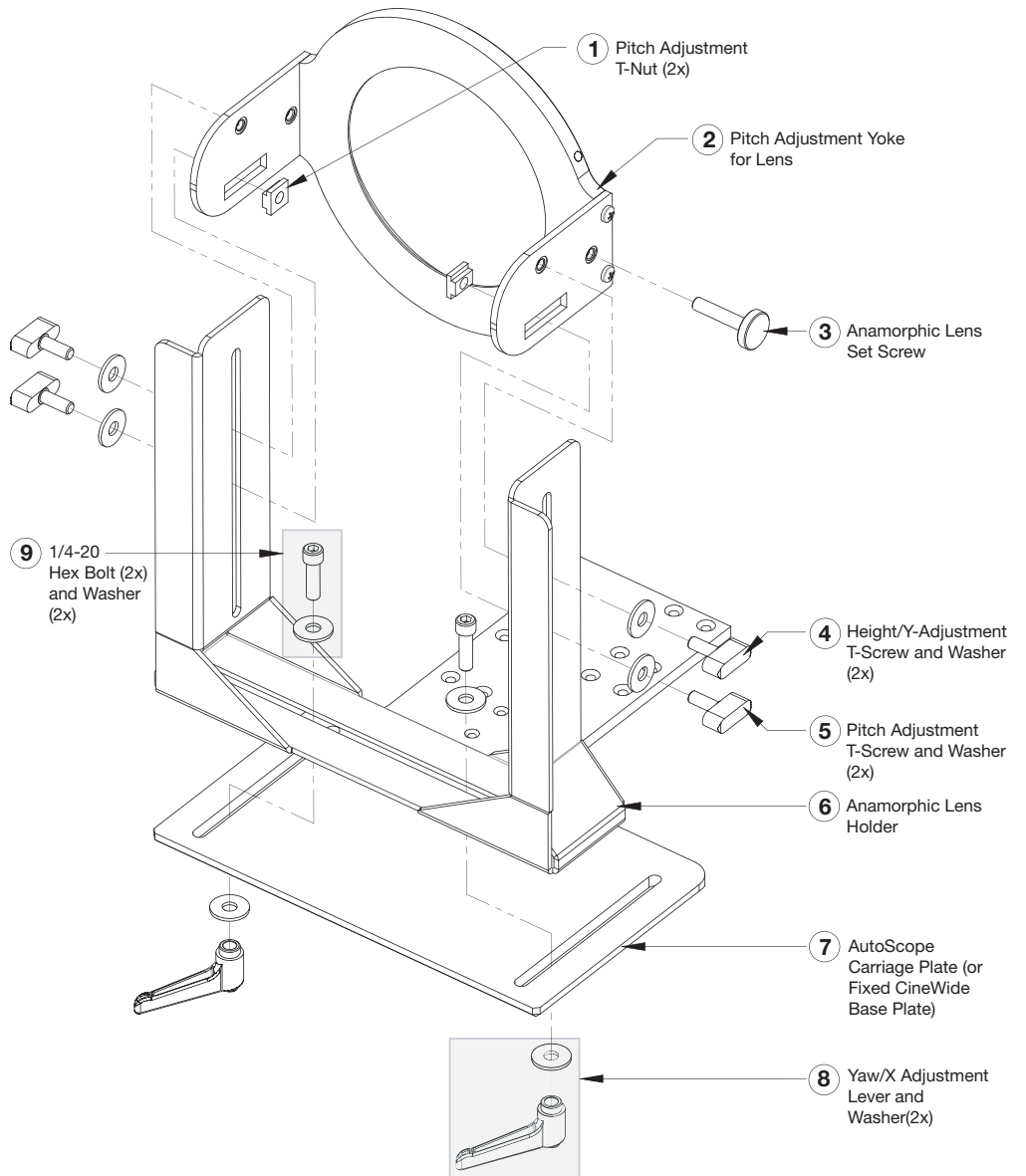


Figure 3-18. Cylindrical Anamorphic Lens Mounting Assembly - Exploded View

Attach Lens Mounting Assembly to Lens Motor Carriage Plate:

1. Remove the two Yaw/X Adjustment Levers and Washers (8) from the bottom of the Anamorphic Lens Holder (6).
2. Place the Anamorphic Lens Holder on top of the AutoScope Carriage Plate or Fixed CineWide Base Plate (7). Position the bracket so that the long slot at the bottom of the lens holder is perpendicular to the corresponding slots on the plate.
3. Secure the Anamorphic Lens Holder to the plate using the Hex Bolts/Washers (9) and Yaw/X Adjustment Levers that you removed in Step 1.
4. Use the Height/Y Adjustment T-Screws/Washers (4), Pitch Adjustment T-Screws/Washers (5) and T-Nuts (1) to attach the Pitch Adjustment Yoke and Lens Adapter Ring to the Anamorphic Lens Holder. **The Yoke should be as close to the primary lens as possible.**
5. Attach the lens to the Lens Adapter Ring by threading it clockwise.

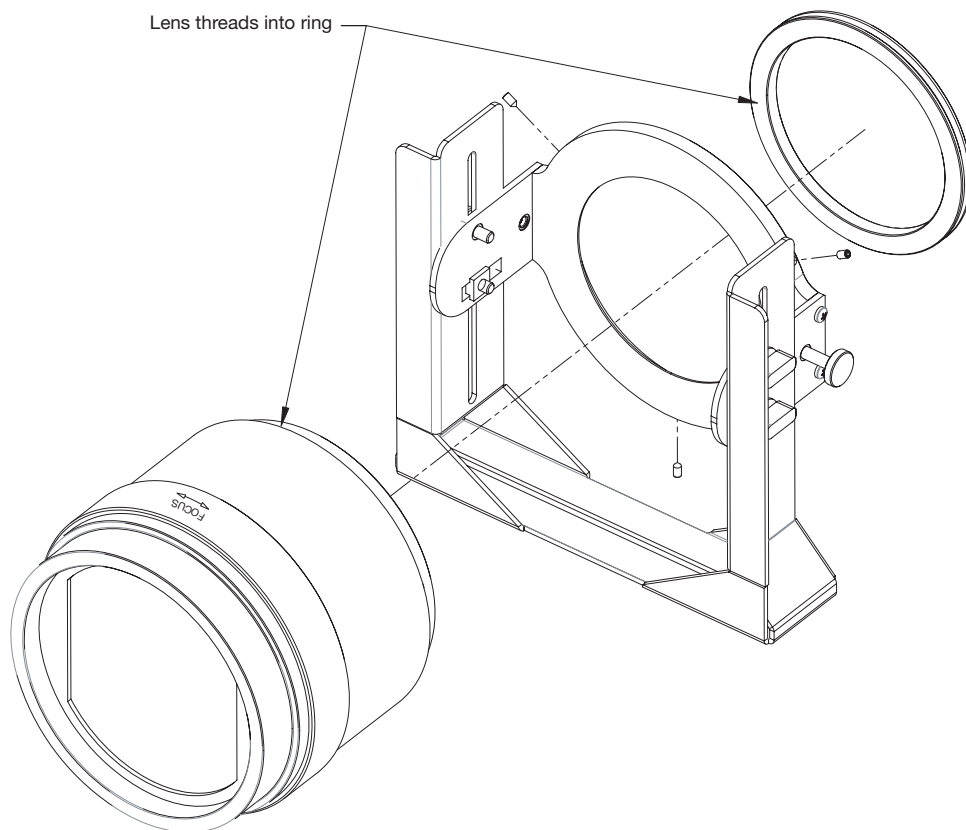
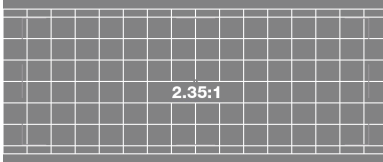


Figure 3-19. Attaching the Anamorphic Lens to the Lens Ring

Configure Lens Motor Trigger (CineWide with AutoScope):

CineWide with AutoScope maintains constant image height independent of the aspect ratio, while using the full display resolution of the projector. It accomplishes this by moving the anamorphic lens in front of the primary lens when widescreen material is being viewed. When the viewer transitions back to 16:9 or 4:3 source material, the anamorphic lens moves out of the light path.

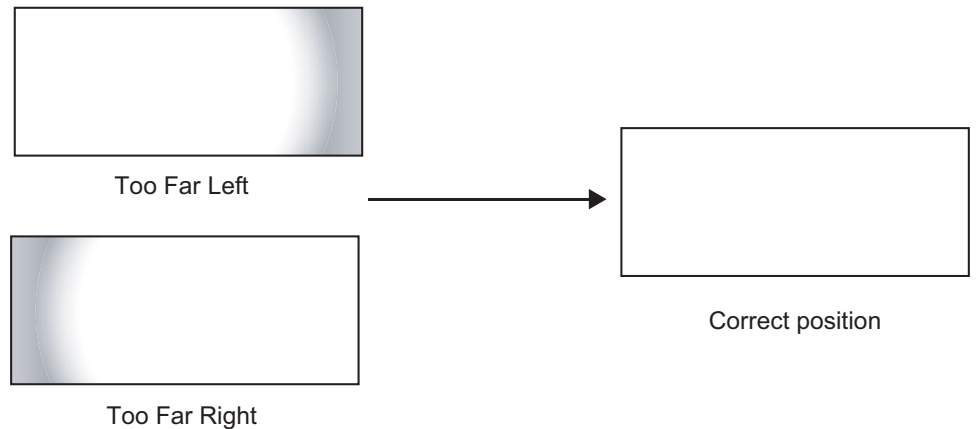
To configure the lens motor trigger on the X-200i for proper AutoScope operation:



1. Project a 2.35:1 aspect ratio test pattern or other image on the screen.
2. On the X-200i remote control or system keypad, press **MENU**.
3. Select **CONTROL** from the Master Menu.
4. If you connected the AutoScope lens motor to the **TRIGGER II** output (as shown in Figure 3-8), confirm that the **Trigger 2** setting is **AutoScope**. (This is the default setting.) Change it if necessary. If you connected the AutoScope lens motor to the **TRIGGER I** output, change the **Trigger 1** setting to **AutoScope**.
5. Select CineWide from the Control menu and set it to **AutoScope**.
6. Select the Cinema or Virtual Cinema aspect ratio to move the anamorphic lens into position, if it isn't already. To do this, press **CINEMA** or **V-CINE** on the X-200i remote control.
7. Proceed as described in the following sections to adjust the anamorphic lens.

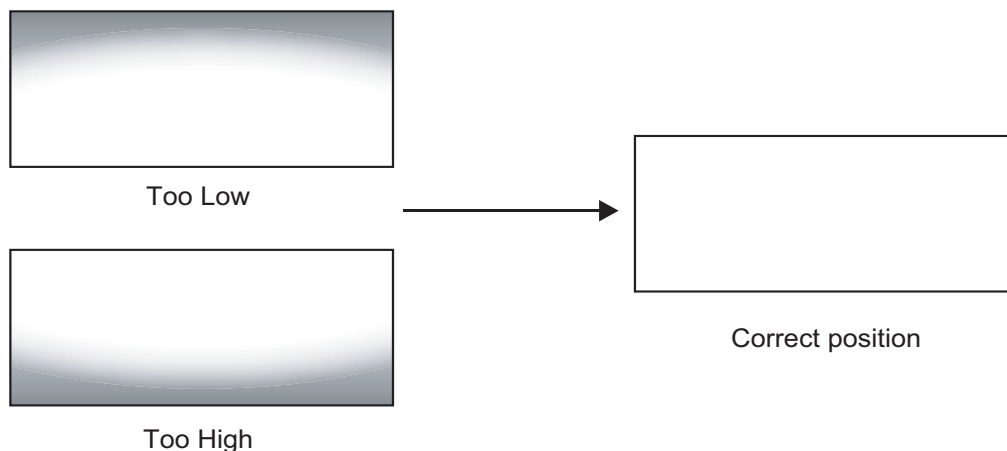
Horizontal Position (X) Adjustment:

1. Project a white field on the screen.
2. Loosen the Yaw/X-Adjustment Levers underneath the lens.
3. Slowly move the anamorphic lens into place (from right to left or vice versa) so that there are no shadows on either side of the screen:



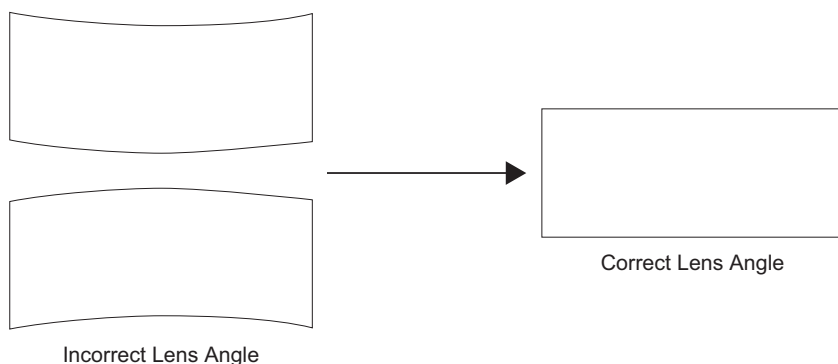
4. When the horizontal position is properly set, tighten the Yaw/X-Adjustment Levers to secure the lens in place.

Adjusting the Height (Y): With the white field still on-screen, loosen the Height/Y Adjustment T-Screws on either side of the lens. Then, slowly move the anamorphic lens into place so that there are no shadows on the top or bottom of the screen:



When the height is properly set, tighten the Height Adjustment T-Screws to secure the lens in place.

Adjusting the Pitch (Angle): Next, angle the lens to even out any top-to-bottom pincushion distortion. To do this, loosen the Pitch Adjustment T-Screws (directly below the Height/Y Adjustment T-Screws) on either side of the lens to allow it to pivot freely. Then, adjust the anamorphic lens angle so that the projected image is rectangular:



The anamorphic lens will almost always be angled with respect to the projector; this is normal.

Once the proper lens angle has been set, firmly tighten the Pitch Adjustment T-Screws to secure the lens in place.

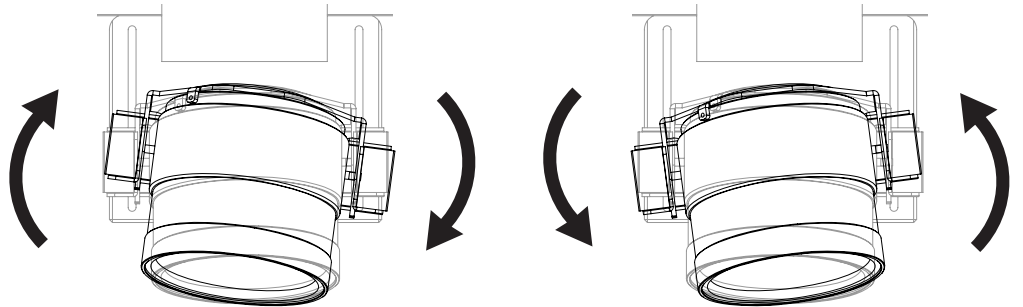


Note

There may be some pincushion distortion even after the lens is properly adjusted, especially at shorter throw distances. If this is the case, Runco recommends that you slightly over-scan the image into the screen frame area to mask the distortion.

Yaw Adjust: Loosen the Yaw/X-Adjustment Levers to allow the lens to pivot freely from side to side. Then, angle the lens to even out any left-to-right pincushion distortion:

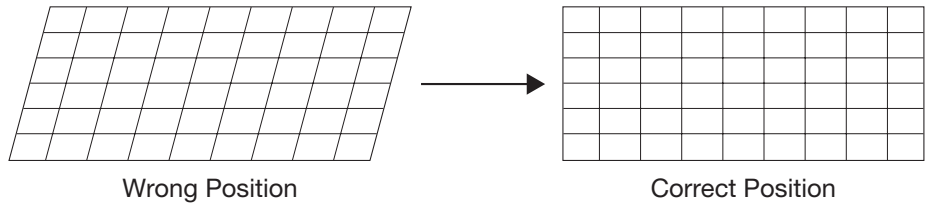
Anamorphic Lens (Top View)



Once the proper lens angle has been set, firmly tighten the Yaw/X-Adjustment Levers to secure the lens in place.

Geometry:

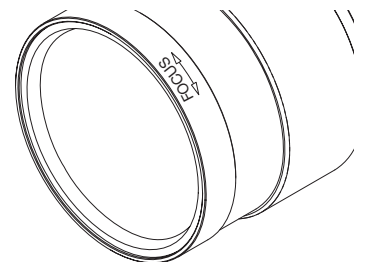
1. Unscrew the Anamorphic Lens just enough to allow it to rotate freely.
2. Grasp the lens by the center ring and rotate the lens until the image is properly anamorphic:



3. When the image geometry appears correct, tighten the Anamorphic Lens Set Screw (3) to secure the lens in place. (When viewed from the front, the rear opening on the anamorphic lens should appear as a tall, narrow oval.)



Focus: Finally, rotate the Focus Ring on the anamorphic lens to fine-tune the optical focus.



The Whitney Anamorphic lens mount kit consists of everything shown in Figure 3-20. Some components shipped with your projector may differ slightly from what is shown in these instructions.

◀ **Whitney (Prismatic)
Anamorphic Lens
Installation and
Adjustment**

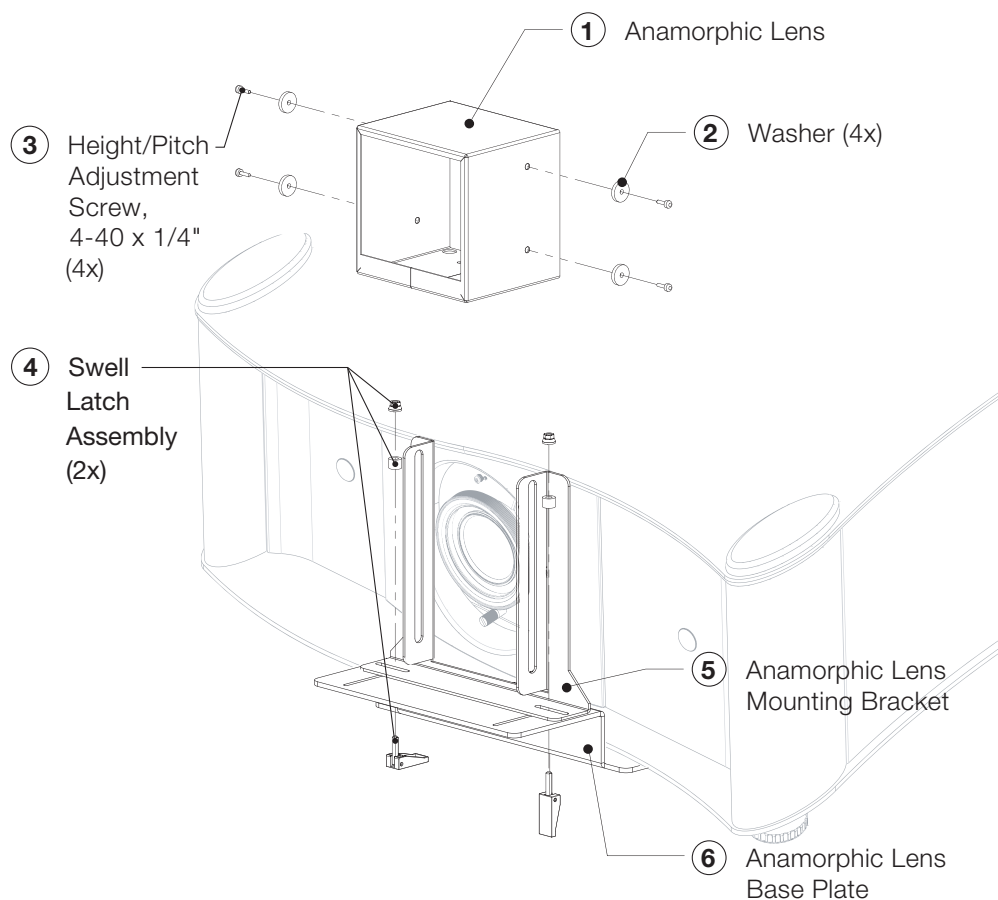
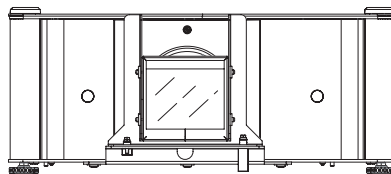
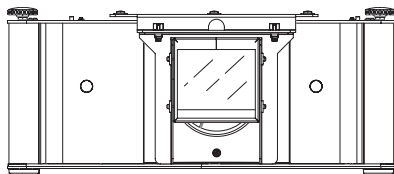


Figure 3-20. Prismatic Anamorphic Lens Mounting Assembly - Exploded View

1. Use the Height/Pitch Adjustment Screws (3) and Washers (2) to attach the Lens Mounting Bracket (5) to the Anamorphic Lens (1).
2. Remove the nut and rubber collar from each Swell Latch Assembly (4).
3. Secure the lens (with the mounting bracket attached) to the Lens Base Plate (6) using the swell latches.

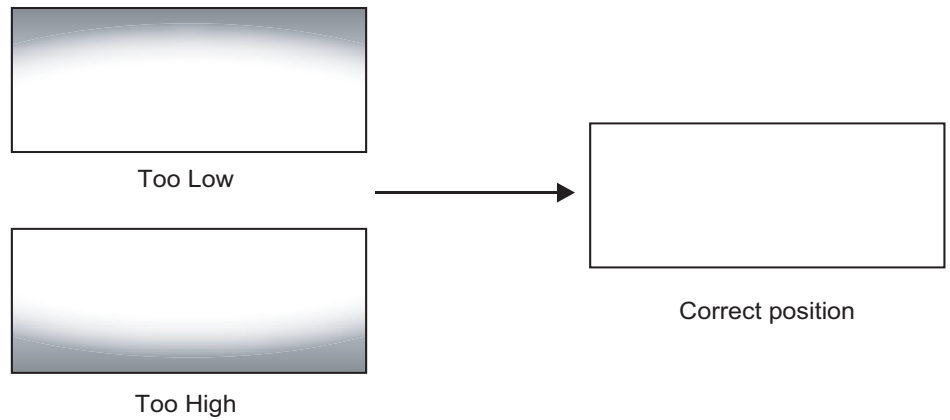


Tip

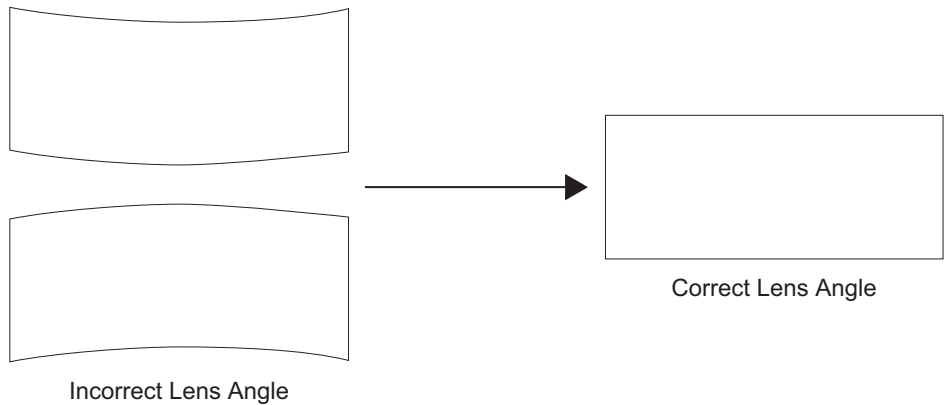
To avoid clipping the corners of the image, position the anamorphic lens as close as possible to the primary lens.

Adjusting the Lens Height and Angle:

1. Project a white field on the screen.
2. Loosen the four Height/Pitch Adjustment Screws just enough to allow vertical movement of the lens assembly.
3. Slowly move the anamorphic lens into place so that there are no shadows on the top or bottom of the screen:



4. Then, adjust the anamorphic lens angle so that the projected image is rectangular:



The anamorphic lens will almost always be angled with respect to the projector; this is normal.

5. When the height and angle are properly set, tighten the Height/Pitch Adjustment Screws to secure the lens in place.

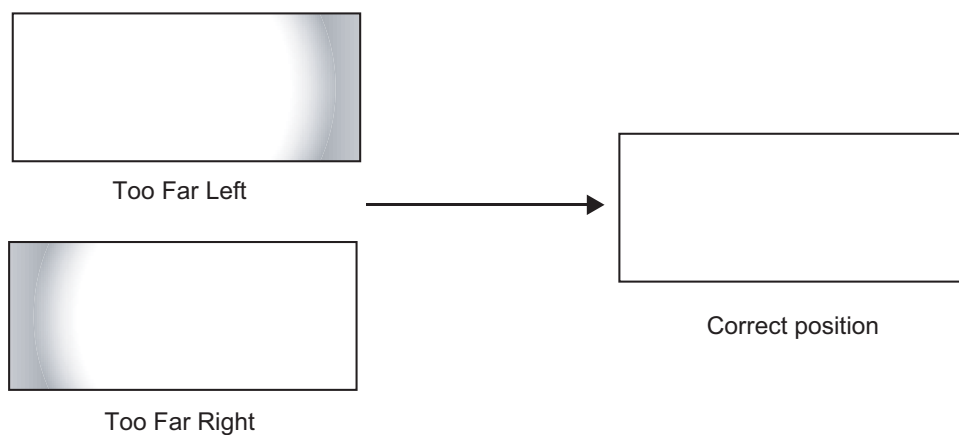


Note

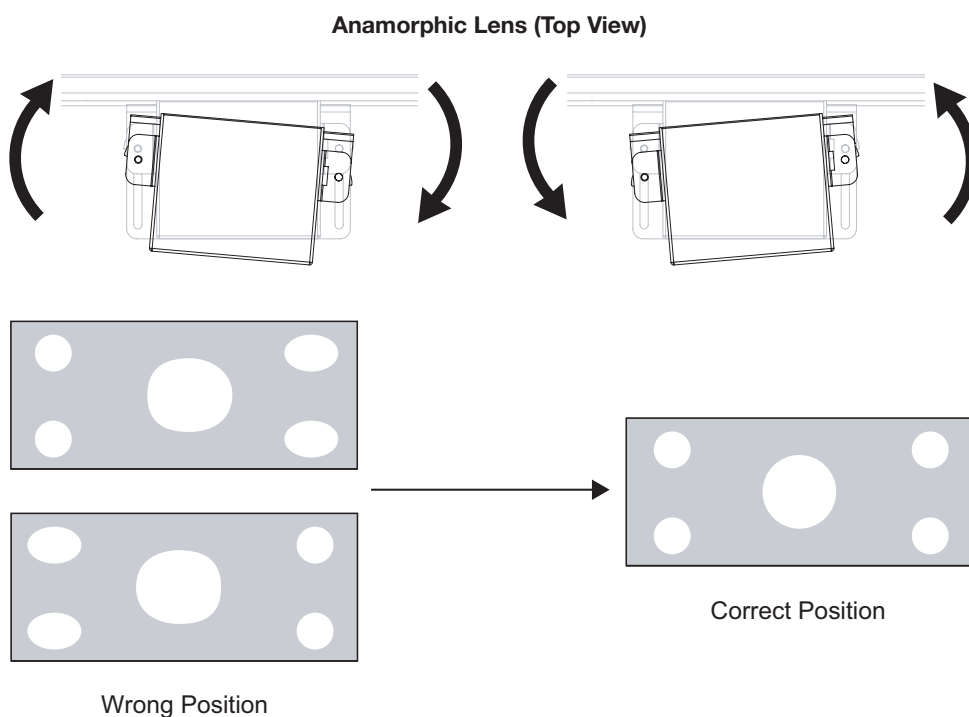
There may be some pincushion distortion even after the lens is properly adjusted, especially at shorter throw distances. If this is the case, Runco recommends that you slightly over-scan the image into the screen frame area to mask the distortion.

Adjusting the Horizontal Position and Yaw:

1. Project a white field on the screen.
2. Release the Swell Latches to allow the lens assembly to pivot and move freely from side to side.
3. Slowly move the anamorphic lens into place (from right to left or vice versa) so that there are no shadows on either side of the screen:



4. Angle the lens to even out any left-right pincushion distortion:

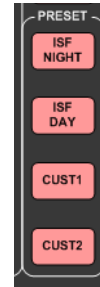


5. When the horizontal position and lens angle are properly set, engage the Swell Latches to secure the lens in place.


Notes:

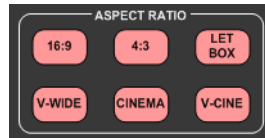
4. Operation

Press **ISF NIGHT**, **ISF DAY**, **CUST1** or **CUST2** to recall settings from a memory preset. Then, press **ENTER** to confirm your selection. Or, to cancel the operation, press **▶** to select **Cancel** and press **ENTER**.



4.1 Selecting Video Memory

To select the appropriate aspect ratio for the type of program material being viewed, press one of the aspect ratio buttons. Or, press the aspect ratio  button repeatedly.



4.2 Selecting an Aspect Ratio

For more information on aspect ratios, refer to Table 4-1.

When you turn on the X-200i, it switches to the last selected input and looks for a valid signal.

Use these buttons on the remote control to select an input source directly, as follows:

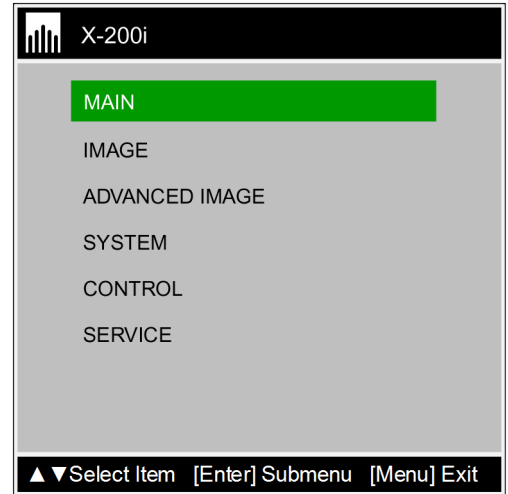
- 1 = HDMI 1
- 2 = HDMI 2
- 3 = Component 1
- 4 = Component 2
- 5 = RGB



4.3 Selecting An Input Source

4.4 Using the On-Screen Menus

1. Press the **MENU** button on the remote control or system keypad to display the Master Menu.
2. There are six menus. Press ▲ or ▼ to select a sub-menu, then press **ENTER** (remote control unit) or **SELECT** (system keypad).
3. Press ▲ or ▼ to select a sub-menu item.
4. For each sub-menu item, the currently-selected value appears in white text or is otherwise highlighted. Press ◀ or ▶ to choose a setting for that item, or press **ENTER** (remote control unit) or **SELECT** (system keypad) to go to another sub-menu.
5. Press **MENU** to return to the previous menu.
6. From the Master Menu, press **MENU** to turn off the OSD menu.



The X-200i OSD menus are arranged hierarchically, as shown in Figure 4-1. Depending on the selected input source and signal characteristics, some menu options may not be available.

Main	Aspect Ratio	16:9 , Letterbox, 4:3, VirtualWide, Cinema or Virtual Cinema	Language	English , Français, Deutsch, Italiano, Español, Svenska, 简体中文 (Simplified Chinese), 繁體中文 (Traditional Chinese), Português, Русский (Russian), 日本語 (Japanese) or 한국어 (Korean)				
	Memory	Recall Memory			Menu Settings			
		Save Memory						
	Overscan	Off , Crop or Zoom			Menu Position	Top Left, Top Right, Bottom Left, Bottom Right or Center		
	3D Control	3D Mode			Menu Transparency	0% (opaque), 25% , 50% or 75%		
		Enable DLP Link				Menu Display Time	Forever, 10 Seconds, 30 Seconds or 60 Seconds	
		L-R Swap					Message Boxes	On or Off
		Dark Time						
		Sync Delay						
	1080p24 Output							
3D Test Pattern								
Input Select	HDMI 1, HDMI 2, Comp. 1, Comp. 2 or RGB	Blank Screen	Black , Blue or White					
Resync	(press ENTER to execute)	Auto Power Off	On or Off					
Image	Brightness	0 ... 100 ... 200	Auto Power On	On or Off				
	Contrast		Projection Mode	Front Tabletop, Front Ceiling, Rear Tabletop or Rear Ceiling				
	Color							
	Tint							
	Sharpness			0 ... 200				
	Noise Reduction			0 ... 200				
Advanced Image	Color Space	Auto , REC709, REC601, RGB-PC or RGB-Video		Logo Display	On or Off			
	Gamma	2.5, 2.35, 2.2 , 2.0 or 1.8	Altitude	Auto or High				
	Color Temperature	5500K, 6500K , 7500K, 9300K or Native	Power On Chime	On or Off				
	Color Gamut	Auto , REC709, SMPTE-C, EBU, Native or PCE	Frame Locking	On or Off				
	SatCo	On or Off	Control	Trigger 1	AutoScope, Lamp , 4:3, or RS-232			
	Adaptive Contrast	On or Off		Trigger 2	AutoScope , Lamp, 4:3, or RS-232			
	DLP Frame Rate	Auto , 48 Hz, 50 Hz or 60 Hz	CineWide	Off , CineWide or AutoScope				
	RGB Adjust	Red / Green / Blue Offset	Auto Source	On or Off				
		Red / Green / Blue Gain		Infrared Remote	Normal , Code 2 or Off			
	Fine Sync	V. Position	HDMI CEC	On or Off				
		H. Position	Service	Active Source	(read-only)			
		Phase		Signal Format				
		Tracking		Pixel Clock				
	Sync Level	Refresh Rate						
	PCE	Hue	Lamp Hours	System Information	(read-only)			
		Saturation	Model Name					
		Level	Serial Number					
		White Balance	Software Version					
	System	Menu Settings	Factory Reset	Reset Everything? (Yes or No)				
			Blue Only	On or Off				
Test Patterns			On or Off					
FPGA Version								

Note: Default settings appear in bold type.

Figure 4-1. X-200i OSD Menu Structure

Main ➤ The X-200i Main Menu, shown in Figure 4-2, provides access to the most commonly-used projector functions.

MAIN >>	
Aspect Ratio	16:9
Memory	Enter
Overscan	Off
3D Control	Enter
Input Select	HDMI 1
Resync	Enter

▲ ▼ Select Item ◀ ▶ Adjust [Menu] Return

Figure 4-2. X-200i Main Menu

Aspect Ratio: To change the aspect ratio (size and shape) of the projected image, press ▲ or ▼ to highlight Aspect Ratio. Use the ◀ or ▶ buttons to select the appropriate aspect ratio for your screen size, installed lens configuration and the type of program material being viewed, then press **ENTER**; refer to Table 4-1.

Table 4-1. Aspect Ratio Settings

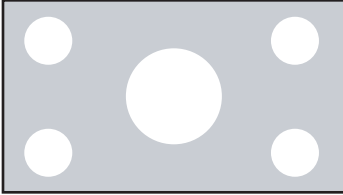
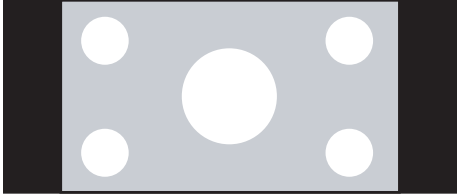
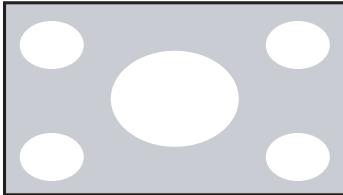
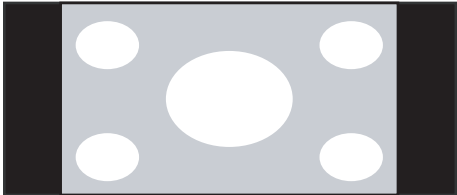
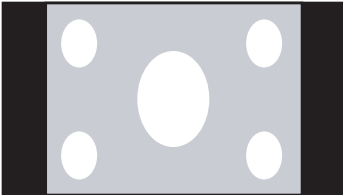
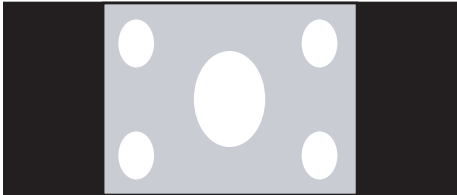
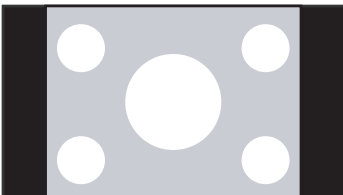
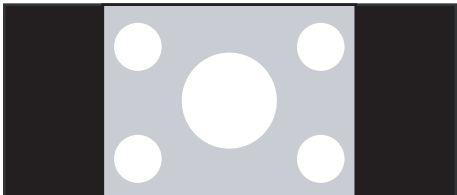
Aspect Ratio Setting	Description	Aspect Ratio of Source Signal	Geometry of Projected Image	
			With Standard Lens (1.78:1 Screen)	With Anamorphic Lens (2.35:1 Screen)
16:9	16:9 linearly scales the source active image horizontally and vertically to fill a 16:9 screen.	16:9		
		4:3		
4:3	4:3 linearly scales the source active image horizontally and vertically to fill a 4:3 rectangle which is centered and the same height as the 16:9 designated image area. The remaining area is black.	16:9		
		4:3		

Table 4-1. Aspect Ratio Settings (continued)

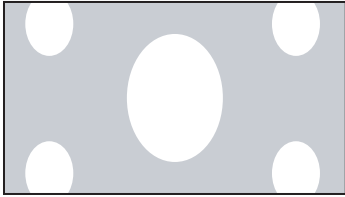
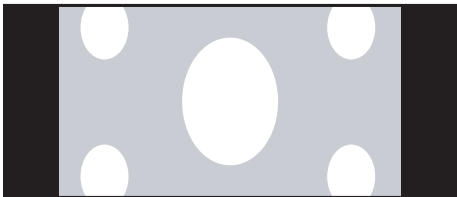
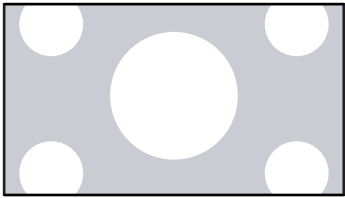
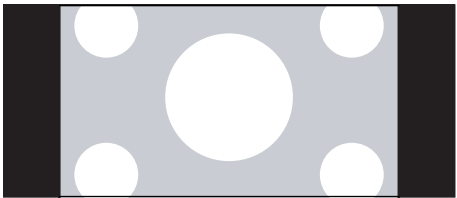
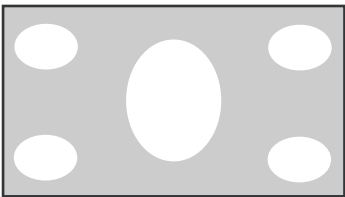
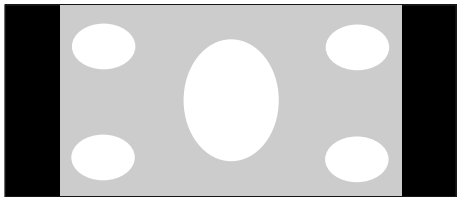
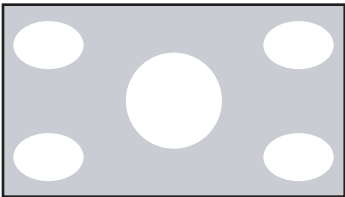
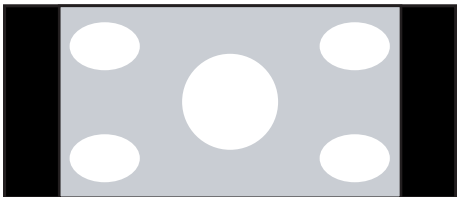
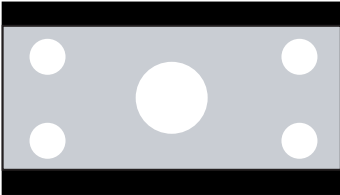
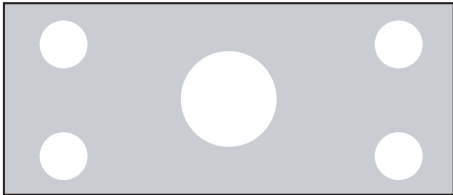
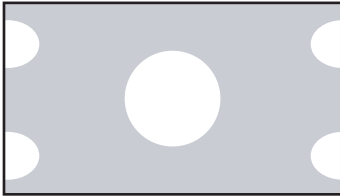
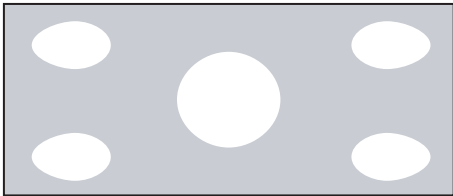
Aspect Ratio Setting	Description	Aspect Ratio of Source Signal	Geometry of Projected Image	
			With Standard Lens (1.78:1 Screen)	With Anamorphic Lens (2.35:1 Screen)
Letterbox	With a 16:9 source image, Letterbox mode crops the top and bottom portion of the image and vertically stretches the remaining portion to fill a 16:9 image area.	16:9		
	It scales (zooms in on) a 4:3 image linearly (by the same amount on all sides) to fill a 16:9 display.	4:3		
Virtual-Wide	A 16:9 image is shrunk horizontally in the center and stretched horizontally in a NON-linear fashion (more on the sides).	16:9		
	A 4:3 image is horizontally scaled in a NON-linear fashion (more on the sides than in the center) to fit a 16:9 screen.	4:3		

Table 4-1. Aspect Ratio Settings (continued)

Aspect Ratio Setting	Description	Aspect Ratio of Source Signal	Geometry of Projected Image	
			With Standard Lens (1.78:1 Screen)	With Anamorphic Lens (2.35:1 Screen)
Cinema	<p>Select Cinema to view 2.35 source material in its native aspect ratio.</p> <p>With a 16:9 screen and no anamorphic lens, the upper and lower portions of the screen are masked, but the geometry of the active image area is unchanged.</p> <p>With a 2.35:1 screen and an anamorphic lens, the video processor scales the 2.35:1 image so that the active image area fills the 16:9 chip surface, eliminating the black bars. The secondary, anamorphic lens then restores the proper geometry to the 2.35:1 image.</p>	2.35:1		
Virtual Cinema	<p>A 16:9 image is scaled NON-linearly (more on the sides than in the center) to fit a 2.35:1 screen.</p>	16:9		

Memory: Select Memory from the Main menu, then press **ENTER** to recall image quality settings previously saved, or to save changed settings in any of four memory locations.

- **Recall Memory:** Select Recall Memory from the Memory menu to recall saved image quality settings. Unless you select **Default** (see below), this control affects all sources, not just the active source.
 - **Custom 1** and **Custom 2** contain the factory default settings when the projector is initially turned on.
 - When you recall the **ISF Day** or **ISF Night** memory settings, all settings associated with these stored values are grayed out. This prevents unintended adjustments from being made. To remove this restriction, choose **Custom 1** or **Custom 2**.

ISF Day and **ISF Night** are grayed out unless these custom settings have already been saved.

- Choose **Default** to restore the factory-default settings for the active source only. The other sources are unaffected.
- **Save Memory:** Select Save Memory from the Memory menu to save any image-related settings you have changed to **Custom 1** or **Custom 2**.

The following items are saved (for **all** sources, not just the active source):

- Brightness / Contrast
 - Color / Tint
 - Sharpness
 - Noise Reduction
 - Color Space
 - Gamma
 - Color Temperature
 - DLP Frame Rate
 - Color Gamut (including PCE settings)
 - SatCo
 - Adaptive Contrast
 - RGB Adjust (all settings in sub-menu)
 - 3D Mode
- **Save ISF:** Select Save ISF from the Memory menu to save any image-related settings you have changed to the **ISF Day** or **ISF Night** memory location.



Note

You must enter a passcode to access the Save ISF sub-menu.

The settings that are saved are the same as those saved with the **Save Memory** command (see above).

Overscan: Some television programs are produced based on the assumption that older television sets may not display the outer edges of the broadcast picture area. Overscan effectively hides these inactive, outer edges of the image. Choose one of the following:

- **Off:** This setting leaves the image as-is.
- **Crop:** This setting adds a mask at the left and right edges of the source active image equal to 3% of the displayed horizontal resolution, and at the top and bottom edges equal to 3% of the displayed vertical resolution.
- **Zoom:** This setting adds a factor to the scaling of the source active image so that the vertical and horizontal resolutions are 106% of the size determined by the aspect ratio function. Anything outside of the original image area is removed.

Figure 4-3 illustrates the effect of each overscan setting for each aspect ratio.

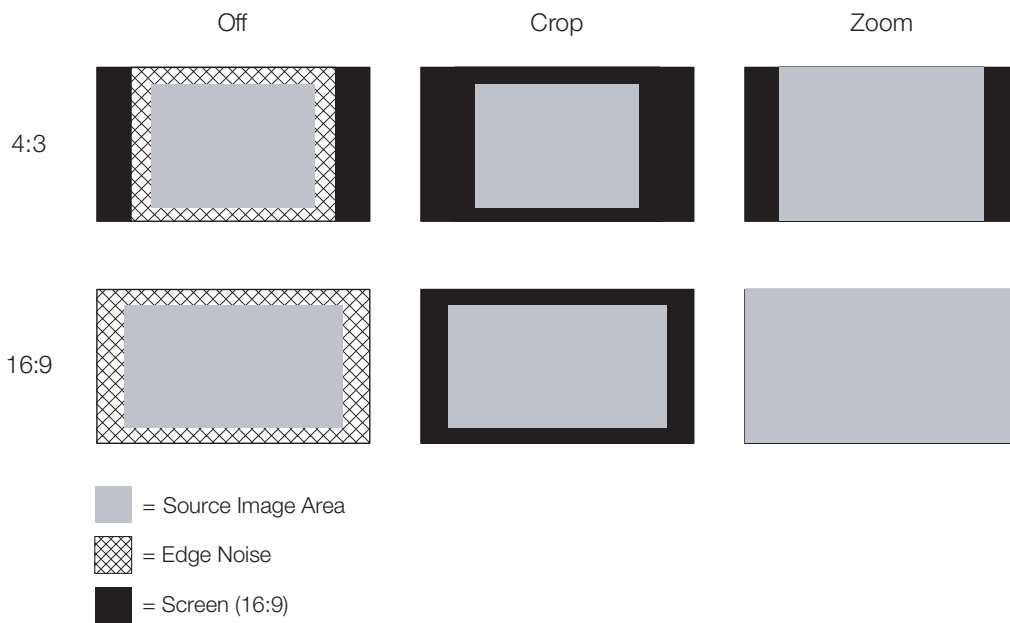
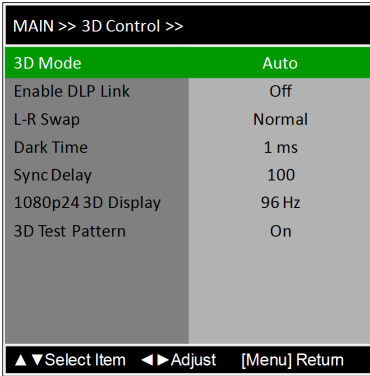
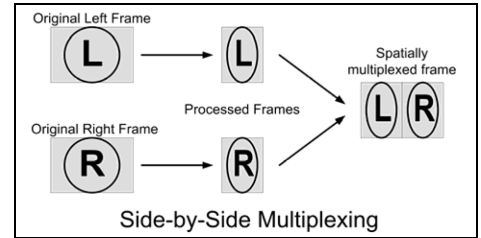


Figure 4-3. Overscan Examples



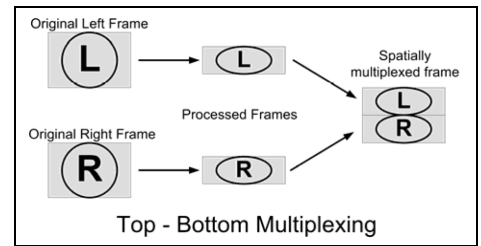
3D Control: Select 3D Control from the Main Menu to set the following options related to formatting and delivery of HDMI 3D content.

- **3D Mode:** Select 3D Mode from the 3D Control menu to specify how the X-200i processes the “left eye” and “right eye” image components.
 - Choose **Auto** to have the X-200i determine the appropriate 3D or 2D mode based on the HDMI vendor-specific InfoFrame data. This is the default setting.
 - Choose **Off** to watch all content, including that mastered in 3D, in 2D.
 - Choose **Side-by-Side** to have the projector scale the left and right image halves respectively to fill the screen.



Side-by-Side multiplexing is used with 1080i source material.

- Choose **Top-and-Bottom** to have the projector scale the top and bottom image halves respectively to fill the screen.



Top-and-Bottom multiplexing is used with 720p or 1080p source material.

- **Enable DLP Link:** Set Enable DLP Link to **On** if you wish to use DLP Link 3D glasses with this projector. The default setting is **Off**.



Note

In order to use this feature, you must set the 1080p24 Output setting (see below) to 96Hz.

- **L-R Swap:** Choose L-R Swap from the 3D Control menu and set it to **Reverse** to reverse the left- and right-eye image components, for content that was mastered backwards.
- **Dark Time:** This control adjusts the amount of dark time between displayed frames for 3D content. Higher settings provide more time for shutters in the 3D glasses to open and close, ensuring that each eye sees the full image intended for it. The available settings are 1.0, 1.5, 2 or 2.5 milliseconds. The default setting is 1.0 ms.



Note

When 1080p24 Output (see below) is set to 144Hz, the available Dark Time settings are 1.0 or 1.5ms.

- **Sync Delay:** This control adjusts the output 3D emitter delay to match the active glasses to the left/right frames of the projector. Proper adjustment of this delay will eliminate crosstalk and odd colors caused by timing differences between the glasses and the projected image.



Tip

Use the system keypad on the projector to adjust this setting, so as not to disrupt communication between the Active 3D Emitter and the 3D glasses.

- **1080p24 Output:** This control selects how 24Hz 3D content will be processed in an active 3D system. This lower frame rate can lead to excessive flickering, creating a need for frame rate conversion (FRC). Choose one of the following:
 - **96Hz** employs a 2:2 cadence.
 - **144Hz** uses a 3:3 cadence.



Note

Due to bandwidth restrictions, the 144Hz mode only provides 1004 lines. The unused lines are set to black and evenly subtracted from the top and bottom of the image.

- **3D Test Pattern:** Choose 3D Test Pattern from the 3D Control menu and set it to **On** to display the 3D test pattern (refer to **Test Patterns** on page 72) while adjusting these settings.

Input Select: To select a video source, press ▲ or ▼ to highlight Input Select, then use the ◀ or ▶ button to select a source. The default source selection is **HDMI 1**.

Resync: If the projected image becomes unstable or degraded, press ▲ or ▼ to highlight Resync, then press **ENTER**. This causes a re-acquisition of the active source. It also changes any Fine Sync settings (described on page 66) for this timing to the default setting.

Use the controls in the Image menu, shown in Figure 4-4, to perform advanced image adjustments.

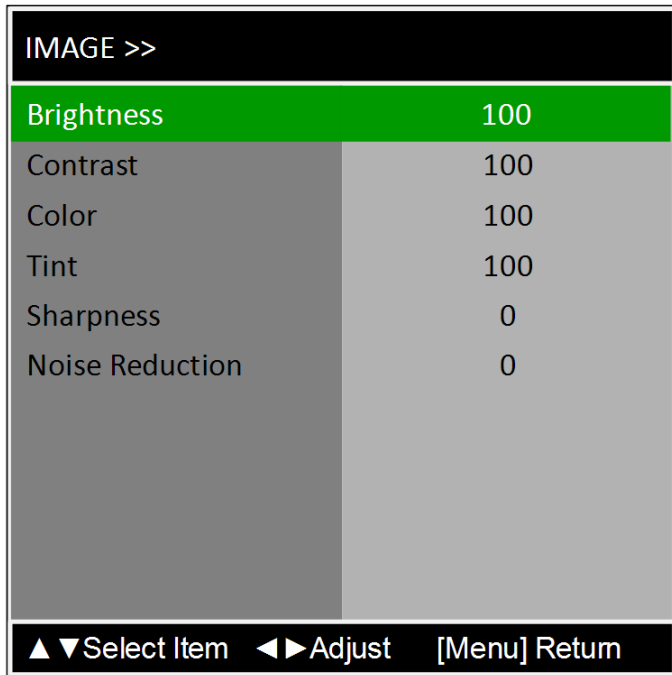


Figure 4-4. X-200i Image Menu

Brightness: On your external test pattern source, select a PLUGE pattern. (PLUGE is an acronym for “Picture Line-Up Generation Equipment.”) Figure 4-5 shows a typical PLUGE pattern.

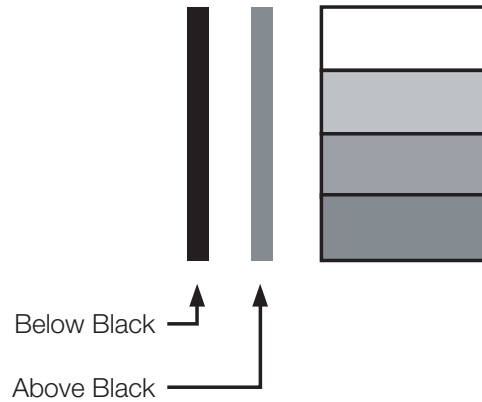


Figure 4-5. Typical PLUGE Pattern for Adjusting Brightness

PLUGE patterns vary but generally consist of some combination of black, white and gray areas against a black background. The example above includes two vertical bars and four shaded boxes.

Select Brightness from the Main menu. Use the ◀ or ▶ buttons to adjust the level so that:

- The darkest black bars disappear into the background.
- The dark gray areas are barely visible.
- The lighter gray areas are clearly visible.
- The white areas are a comfortable level of true white.
- The image contains only black, gray and white (no color).

Contrast: On your external test pattern source, select a stepped, gray-bar pattern like the one shown in Figure 4-6.

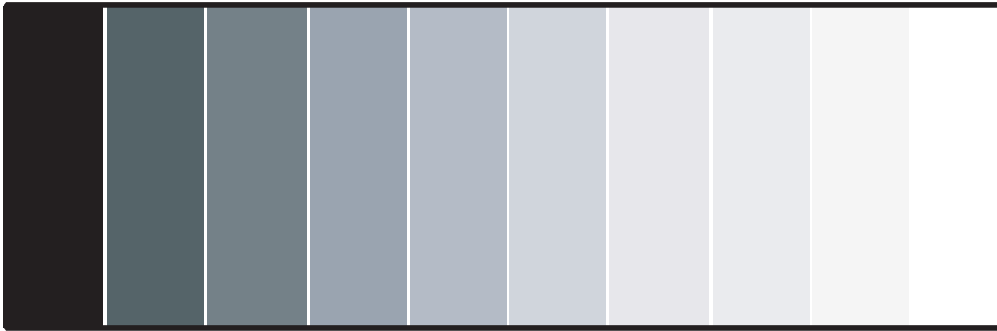


Figure 4-6. Typical Gray Bar Pattern for Adjusting Contrast

Select Contrast from the Main menu. Use the ◀ or ▶ buttons to adjust the contrast up until the top two bars become almost the same brightness, then down just until the brightness change between these bars is consistent with the other bars.



Note

Brightness and Contrast controls are interactive. A change to one may require a subtle change to the other in order to achieve the optimum setting.

Color: To adjust the overall color intensity, select Color from the Main menu. Decrease this setting if colors are overly saturated; increase it if colors appear muted or washed out.

Tint: Tint or “hue” is the ratio of red to green in the color portion of the image. To adjust the tint, select Tint from the Main menu. Decrease this setting to shift the hue toward red; increase it to shift the hue toward green.



Note

Like the Brightness and Contrast controls, the color and tint controls are interactive. A change to one may require a subtle change to the other in order to achieve the optimum setting.

Sharpness: “Sharpness” is the amount of high-frequency detail in the image. To adjust this, select Sharpness from the Main menu and press **ENTER**. On your external test pattern source, select a pattern like the one shown in Figure 4-7.

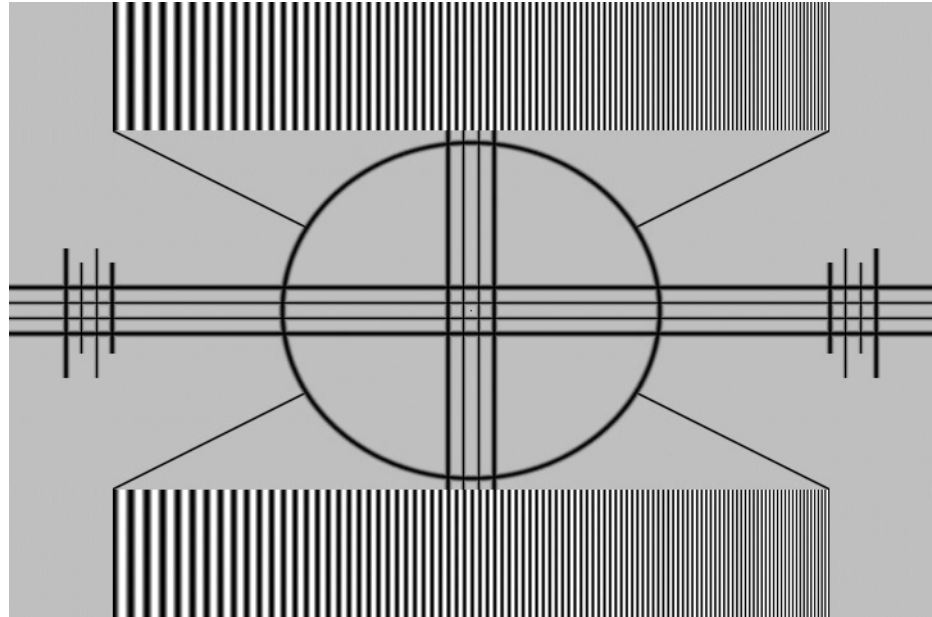


Figure 4-7. Typical Test Pattern for Adjusting Sharpness

Adjust as needed, looking for white edges around the transitions from black to gray and differently-sized lines in the “sweep” patterns at the top and bottom. Lower the sharpness setting to eliminate them.

Noise Reduction: To apply noise reduction to the source signal, select Noise Reduction from the Main menu and press **ENTER**. Noise Reduction is useful for clearing up noisy images from interlaced SD sources.

Use the ◀ or ▶ button to adjust as desired, keeping in mind that reducing noise (which reduces high frequencies) may also soften the image.

Use the controls in the Advanced Image menu, shown in Figure 4-8, to perform advanced image adjustments.

◀ **Advanced Image**

ADVANCED IMAGE >>	
Color Space	Auto
Gamma	2.2
Color Temperature	6500K
Color Gamut	Auto
SatCo	Off
Adaptive Contrast	Off
DLP Frame Rate	Auto
RGB Adjust	Enter
Fine Sync	Enter
PCE	Enter

▲ ▼ Select Item ◀ ▶ Adjust [Menu] Return

Figure 4-8. X-200i Advanced Image Menu

Color Space: Select Color Space from the Advanced Image menu to choose the color space of the source signal for HDMI, RGB, and component connections.

- The default setting, **Auto**, functions as follows:
 - **HDMI:** If the Auxiliary Video Information (AVI) infoframe contains color space and/or range data, the X-200i uses that information. Otherwise, for RGB sources, the X-200i uses the **RGB-Video** color space. For component SDTV and EDTV resolutions, **REC601** is used. For other component video resolutions, **REC709** is used.
 - **RGB:** If Hsync or Vsync signals are present, the X-200i uses the **RGB-PC** color space. Otherwise, **REC601** is used for SDTV and EDTV sources, and **REC709** for all other sources.
 - **Component:** For SDTV and EDTV resolutions, the X-200i uses the **REC601** color space. For all other resolutions **REC709** is used.

In most cases, the **Auto** setting determines the correct color space to use. If it does not, you can force the X-200i to use a specific color space. Choose one of the following:

- **REC709** sets the color space matrix to that defined in ITU-R BT.709.
- **REC601** sets the color space matrix to that defined in ITU-R BT.601.
- **RGB-PC** uses RGB color space and sets black at 0,0,0 RGB and white at 255,255,255 RGB, assuming an 8-bit image.
- **RGB-Video** uses RGB color space and sets black at 16,16,16 RGB and white at 235,235,235, assuming an 8-bit image, to correspond to the luminance values defined in digital component standards.

Gamma: Select Gamma from the Advanced Image menu to choose a DLP de-gamma curve. The available settings are 1.8, 2.0, 2.2, 2.35 and 2.5. The value chosen here corresponds to the power variable in this equation:

$$\text{Output} = \text{Input}^{\text{Power}}$$

The X-200i applies this gamma curve to all three primary color channels (red, green and blue). Used correctly, the Gamma control can improve contrast while maintaining good details for blacks and whites.

If excess ambient light washes out the image and it becomes difficult or impossible to see details in dark areas, lower the gamma setting to compensate. This improves contrast while maintaining good details for blacks. Conversely, if the image is washed out and unnatural, with excessive detail in black areas, increase the setting.

Color Temperature: Color temperature defines the “color of gray;” that is, adjusts the 75% white point to various color points.

To choose a color temperature setting, select Color Temperature from the Advanced Image menu. Then, press ◀ or ▶ to select **5500K**, **6500K**, **7500K** or **9300K**. The default setting, 6500K, is appropriate for most situations. Higher settings produce a “bluer” picture; lower ones impart a reddish hue to the image. Select **Native** to disable white point adjustment of the source signal.

**Note**

*The Color Temperature setting is unavailable when you choose the “PCE” Color Gamut setting (refer to **Color Gamut**, below).*

DLP Frame Rate (2D content only): Select DLP Frame Rate from the Advanced Image menu to choose the output frame rate for 2D content. You can have the X-200i automatically determine the optimum frame rate, or you can force it to use a specific frame rate. (This control is disabled when viewing 3D content.)

- The default setting, **Auto**, frame locks to the main source if it has a vertical refresh rate of between 48 and 62Hz. Vertical refresh rates of from 24 to 31Hz are doubled. Frame rates between 31 and 48Hz and greater than 62Hz are converted to 60Hz.
- Select **48Hz** to force the output frame rate to 48Hz. Use this setting to eliminate 2:3 pull-down judder with 60Hz film-based sources.
- **50Hz** and **60Hz** force the output frame rate to 50Hz and 60Hz respectively.

Color Gamut: Select Color Gamut from the Advanced Image menu to select a color gamut (range) that may be different from the default color gamut.

Each setting defines the precise hue of each primary (red, green and blue) and secondary (yellow, cyan and magenta) color component used to generate the millions of colors produced in displays. Changing either or both of these numbers changes the hue of the color and relocates the “triangle” for possible colors. For example, changing the x/y coordinates for red moves the color closer to either orange or violet, which in turn affects all displayed colors having a red component.

- **Auto** automatically chooses the appropriate color gamut:
 - **SMPTE C** for NTSC, 480i and 480p sources.
 - **EBU** for PAL, SECAM, 576i and 576p sources.
 - **REC709** for all other sources.

- **REC709** chooses the REC709 color gamut.
- Select **SMPTE-C** to choose the SMPTE-C color gamut.
- Select **EBU** to choose the EBU color gamut.
- Select **Native** to use REC709 for cyan, magenta, and yellow and uncorrected values for red, green, and blue.
- Select **PCE** to use the Personal Color Equalizer feature of the X-200i. PCE lets you define a custom color gamut. Refer to **PCE** on page 67 for instructions on how to do this.

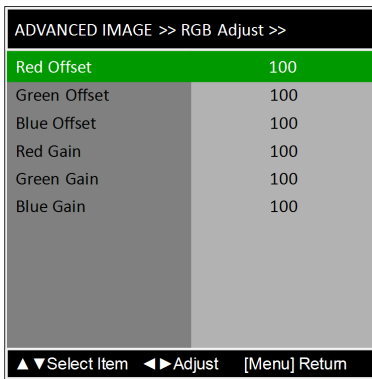
Table 4-2 lists the x- and y-coordinates for each primary and secondary color component.

Table 4-2. x/y Color Gamut Values

Primary Color	Color Gamut Settings and Associated x/y Values					
	REC709		SMPTE "C"		EBU	
	x	y	x	y	x	y
Red	0.640	0.330	0.630	0.340	0.640	0.330
Yellow	0.419	0.505	0.421	0.507	0.418	0.502
Green	0.300	0.600	0.310	0.595	0.290	0.600
Cyan	0.225	0.329	0.231	0.326	0.220	0.329
Blue	0.150	0.060	0.155	0.070	0.150	0.060
Magenta	0.321	0.154	0.314	0.161	0.328	0.158

SatCo: Select SatCo from the Advanced Image menu to enable (**On**) or disable (**Off**) BrilliantColor processing, which improves brightness in grays and secondary colors by using the spoke light from the color wheel.

Adaptive Contrast: Adaptive Contrast enhancement expands the light and dark portions of an output image according to the mean luminance of the input image.



RGB Adjust: To remove any trace of color from the white areas of the projected image, choose RGB Adjust from the Advanced Image menu and press **ENTER**. This displays the RGB Adjust sub-menu, shown at right.

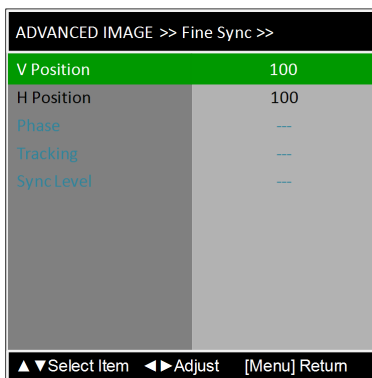
- **Gain:** Use the Gain controls to correct color imbalances in the bright areas of the image. A good way to do this is to use a test pattern consisting mostly of solid white areas, such as an 80 IRE “window” pattern. If the white areas contain traces of red, green or blue, decrease the Gain for that color.
- **Offset:** Use the Offset controls in the RGB Adjust sub-menu to correct color imbalances in the dark areas of the image. A good way to do this is to use a test pattern consisting mostly of dark gray areas, such as a 30 IRE “window” pattern. If the gray areas contain traces of red, green or blue, decrease the Offset for that color.

The Gain controls increase or decrease the full-scale input range; the Offset controls shift the entire range, resulting in a change in brightness.



Note

Generally, higher Gain settings reduce the image contrast; higher Offset settings reduce the image brightness.



Fine Sync: To fine-tune the position and other image attributes, choose Fine Sync from the Advanced Image menu and press **ENTER**. This displays the Fine Sync sub-menu, shown at right.

- **V Position:** This control adjusts the vertical position of the image within the designated image area, up to 25 per cent of the image height up or down.
- **H Position:** This control adjusts the horizontal position of the image within the designated image area, up to 25 per cent of the image width left or right.
- **Phase (RGB or Component sources):** This control adjusts the phase of the pixel sampling clock relative to the incoming signal. Adjust the phase when an RGB or Component image still shows shimmer or “noise” after Tracking has been optimized.



Tip

Adjust the Phase **after** adjusting Tracking (see below). If some shimmer from a video or HDTV source persists, use the Noise Reduction controls (described on page 62) to remove high-frequency noise from the signal.

For best results, use a good test pattern such as a smooth gray consisting of a clear pattern of black and white pixels, or a similar “half on, half off” graphic image. Adjust the sidebar until the image stabilizes and each pixel is clearly defined. You may notice that you can stabilize the image at more than one point. Use either setting in such cases.

- **Tracking (RGB or Component sources):** Tracking determines the frequency of the pixel sampling clock, indicated by the number of incoming pixels per line, so that all pixels generated by a particular source are sampled.

Steady flickering or several soft vertical stripes or bands across the entire image indicates poor pixel tracking. Proper pixel tracking helps ensure that the image quality is consistent across the screen, that aspect ratio is maintained and that pixel phase (see above) can be optimized.

- **Sync Level (Component sources only):** Select Sync Level to adjust the voltage level of the X-200i Sync signal detection circuitry.

Sync Level adjustment is occasionally necessary when a DVD player or HDTV source signal drops “below black” (for example, during scenes with explosions or when subtitles are present) and causes the projector to temporarily lose sync. If the Sync Level from the source is persistently too low, the projector won’t sync with the source at all.

The range is from 50 to 256 millivolts (mV) inclusive. The default setting is 240 mV and should rarely require adjustment.

PCE: To use the Personal Color Equalizer to define a custom color gamut, choose the “PCE” Color Gamut setting (refer to **Color Gamut** on page 64). Then, choose PCE from the Advanced Image menu and press **ENTER**. This displays the PCE sub-menu.

Hue/Saturation/Level: PCE provides the ability to define a custom color gamut in terms of primary (red, green and blue) and secondary (yellow, cyan and magenta) color hues, saturation and level (brightness).

Each control operates only on the color specified. Surrounding colors are linearly interpolated based on their distance from each of these colors. In the CIE 1931 Yxy coordinate system (see Figure 4-9), Hue rotates the color coordinates around the white point, Saturation adjusts the coordinate's distance from white and Level adjusts the luminance (Y) of the color relative to white.

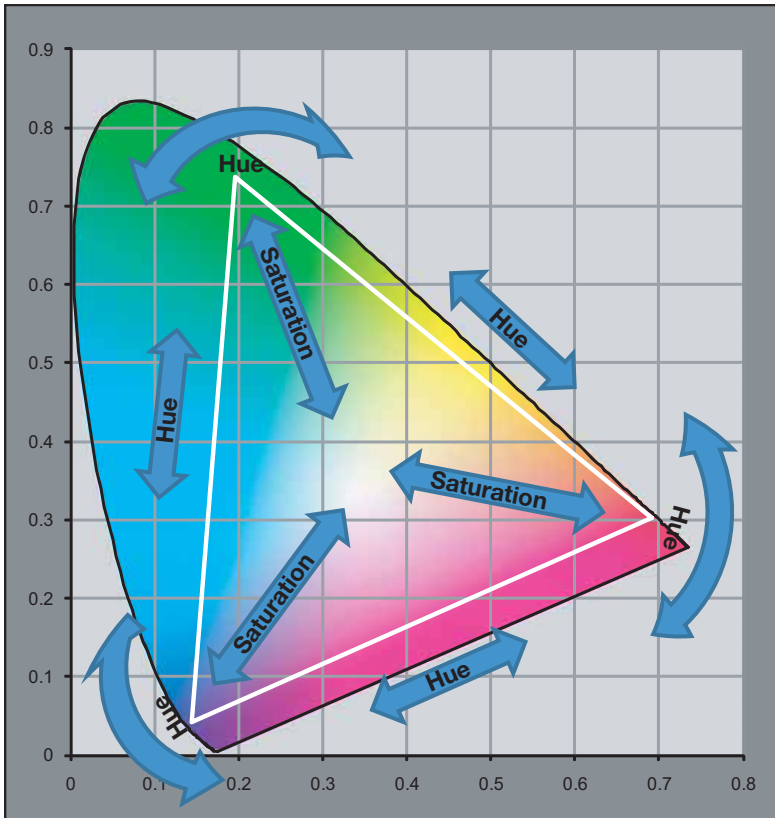
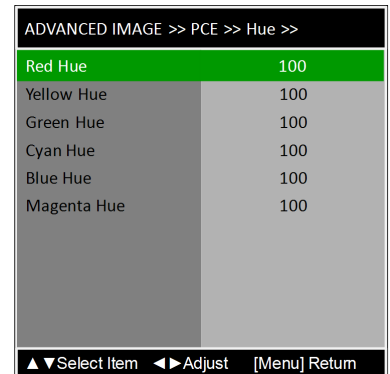
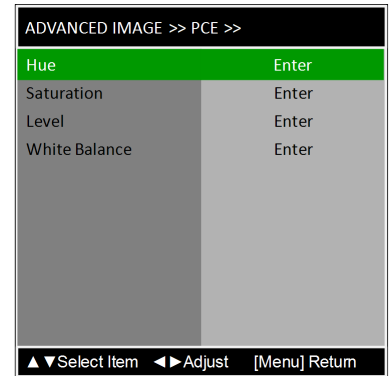


Figure 4-9. CIE 1931 Color Coordinate Diagram and Effect of PCE Hue and Saturation Controls

White Balance: To precisely adjust the white point associated with the custom color gamut, choose White Balance from the PCE sub-menu. These controls operate identically to the Gain controls in the RGB Adjust menu (described on page 66).

System ➤ Use the controls in the System menu, shown in Figure 4-10, to change the display orientation and perform other, common installation tasks.

SYSTEM >>	
Menu Settings	Enter
Blank Screen	Black
Auto Power Off	Off
Auto Power On	Off
Projection Mode	Front Tabletop
Logo Display	On
Altitude	Auto
Power-On Chime	On
Frame Locking	Off

▲ ▼ Select Item ◀ ▶ Adjust [Menu] Return

Figure 4-10. X-200i System Menu

Menu Settings: Select Menu Settings from the System menu to customize the OSD menu appearance and behavior, as follows.

SYSTEM >> Menu Settings >>	
Language	English
Menu Position	Center
Menu Transparency	0%
Menu Display Time	30 Seconds
Message Boxes	On

▲ ▼ Select Item ◀ ▶ Adjust [Menu] Return

- **Language:** Select Language from the Menu Settings menu to change the OSD language. Refer to **Changing the OSD Language** on page 38 for detailed instructions.
- **Menu Position:** Select Menu Position from the Menu Settings menu to change the OSD menu position. The default setting is **Center**.
- **Menu Transparency:** Select Menu Transparency from the Menu Settings menu to adjust the degree of translucence (show-through) in the menus and message boxes. 0% means that the menus are opaque. The default setting is **25%**.
- **Menu Display Time:** Select Menu Display Time from the Menu Settings menu to specify how long the OSD menu remains on-screen after any key presses. The default setting is **30 Seconds**.
- **Message Boxes:** When you select a new input source or turn the projector off, or when an error occurs, the X-200i briefly displays an on-screen message confirming your action or briefly describing the error. To prevent the display of these messages, select Message Boxes from the Menu Settings menu to and set it to **Off**.

Blank Screen: Select Blank Screen from the System menu to choose the color of the blank screen that appears when no source signal is present. The options are **Black**, **Blue** and **White**. The default is **Black**.

Auto Power Off: Set Auto Power Off to **On** to have the X-200i turn itself off after 20 minutes of inactivity (no source signal present).

Auto Power On: Setting Auto Power On to **On** causes the projector to automatically power up when AC power is present. If the projector is plugged into a switched AC outlet, this allows the projector to be turned on using a wall switch instead of the remote control unit. If you do not need this capability, set Auto Power On to **Off** (this is the default setting).

Projection Mode: This control reverses all images and menus, and is necessary when the projector is used in rear-projection applications. This control also flips the image so the projector can be used in ceiling-mounted installations.

The default is **Front Tabletop**, for installations where the projector is upright and in front of the screen.

Logo Display: This controls whether or not the Runco logo appears during startup.

Altitude: Select Altitude from the System Menu to control the operation of the projector's cooling fan.

In most cases, the default setting (**Auto**) will maintain the correct operating temperature. If the lamp frequently turns off due to overheating, or in certain high-altitude operating environments, you may need to change this setting to **High**.

Power On Chime: This controls the audible chime at startup.

Frame Locking: This controls whether or not frame-locking is turned on for 2D sources. (3D sources are always frame-locked.)

- Control** ➤ Select Control from the Main Menu to set various options related to control of the projector.

CONTROL >>	
Trigger 1	Lamp
Trigger 2	AutoScope
CineWide	Off
Auto Source	Off
Infrared Remote	Normal
HDMI CEC	On

▲ ▼ Select Item ◀ ▶ Adjust [Menu] Return

Trigger 1: Select Trigger 1 from the Control menu to specify when the Trigger 1 port outputs 12 volts. There is a three-second delay before activation to prevent operation while selecting an aspect ratio.

- **AutoScope** causes the port to output 12 volts whenever the the Cinema or Virtual Cinema aspect ratio is active.
- **Lamp** causes the port to output 12 volts whenever the lamp is on.
- **4:3** causes the port to output 12 volts whenever the 4:3 aspect ratio is chosen. The output stops if PIP is enabled (PIP source is set to anything other than off).
- **RS232** causes the port to output 12 volts when an RS232 screen trigger 1 “on” command is received and stop when a trigger 1 “off” command is received. The 12 volt output also stops when the projector is turned off.

Trigger 2: Select Trigger 2 from the Control menu to configure the Trigger 2 output. Trigger 2 operates identically to Trigger 1.

CineWide: Select CineWide from the Control menu and set it according to the installed lens configuration, as follows:

- For a standard X-200i (no anamorphic lens), choose **Off**.
- For a X-200i with a fixed anamorphic lens, choose **CineWide**.
- For a X-200i with a movable anamorphic lens, choose **AutoScope**.

Auto Source: This control chooses whether or not to scan for other active sources if the current source is not available. The default setting is **Off**.

Infrared Remote: Select Infrared Remote from the Control menu to specify the remote IR code set to which the X-200i responds. The default is **Normal**. Choose **Code 2** if other equipment in the theater responds to commands from the X-200i remote control in ways that are unexpected or undesirable. Choose **Code 2** to disable IR communication altogether.

When you select a different remote code set on the X-200i, you must re-program the remote control unit to use that same code set. To do this, press and hold the **LIGHT** and **ENTER** buttons simultaneously for approximately five seconds. When the code set has changed, the remote control back-lighting “blinks” to visually confirm the change.

Table 6-1 lists the IR codes associated with each remote control button.

HDMI CEC: This control chooses whether or not the X-200i responds to HDMI CEC control messages from a disc player, set-top box or other HDMI source.

The default setting is **On**. For more information about CEC, refer to **Using HDMI CEC Messages** on page 93.

Access the Service Menu, shown in Figure 4-11, to view information that indicates the projector’s current operational status:

◀ **Service**

- Active Source
- Signal Format
- Pixel Clock
- Refresh Rate
- Lamp Hours (number of lamp hours elapsed since the last reset)

Should you ever need to contact Runco Technical Support, this information will help them answer your questions and/or resolve product performance issues.

SERVICE >>	
Active Source	HDMI 1
Signal Format	1080p / 60Hz
Pixel Clock	148.50 MHz
Refresh Rate	H: 67.84 kHz V: 60.00 Hz
Lamp Hours	1 HRS
System Information Enter	
Factory Reset	Enter
Blue Only	Off
Test Patterns	Off
▲▼ Select Item [Enter] Submenu [Menu] Exit	

Figure 4-11. X-200i Service Menu

You can also perform various diagnostic tasks, such as displaying test patterns, from this menu.

System Information: Select System Information from the Service menu to view information that uniquely identifies your projector: its Model Name, Serial Number, installed Software Version and FPGA Version.

Should you ever need to contact Runco Technical Support, this information will help them answer your questions and/or resolve product performance issues.

Factory Reset: Select Factory Reset from the Service menu to restore all projector settings – except those listed below – to their factory-default values:

- Lamp Hours
- Custom 1 / Custom 2
- ISF Day
- ISF Night
- Model Name / Serial Number
- Language

Blue Only: This feature removes all red and green color information from the image, and is useful for color-calibrating the projector or other video components.

Test Patterns: The X-200i has numerous internal test patterns that are useful to technicians for advanced calibration, measurement and fault isolation purposes. To access them, select Test Patterns from the Service menu and set it to **On**.

The available test patterns are:

- White
- Black
- Red
- Green
- Blue
- Cyan
- Magenta
- Yellow
- ANSI Checkerboard
- Horizontal Gray Ramp
- Focus Grid

Press ◀ or ▶ on the remote control unit or system keypad to cycle through the test patterns.



Note

The OSD menus are not available when in “test pattern” mode.

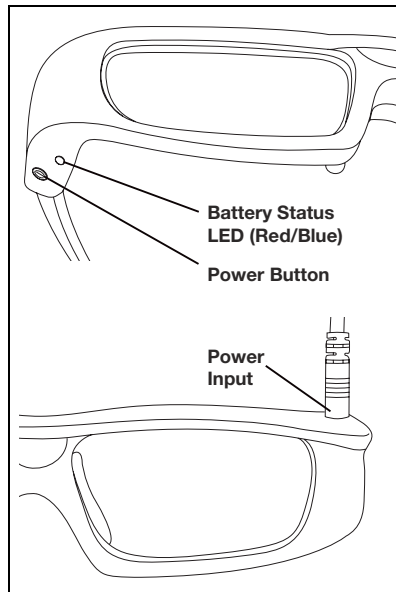
To turn test patterns off, press any key other than ◀ or ▶ on the remote control unit or system keypad.

The 3D LCD Shutter Glasses function with the Runco Active3D Emitter and the projector to provide unsurpassed 3D stereoscopic viewing. This section describes the features, connection, setup and operation of the 3D LCD Shutter Glasses.

- RF synchronization for uninterrupted 3D performance
- Supports refresh rates from 50 to 240 Hz for compatibility with both current and future 3D technology
- High contrast ratio, high uniformity and fast response time for an excellent 3D experience
- Rechargeable battery provides up to 15 hours of 3D viewing per charge
- Battery charge indicator lets you know remaining operating time

The 3D LCD Shutter Glasses have the following key functional components:

- **Battery Status LED**
Indicates battery charge state as described in the following sections, **Charging the Battery** and **Turning On the Glasses**.
- **Power Button**
Press to turn the glasses on or off.
- **Power Input**
To charge the glasses, connect this input to your PC or other USB power source, using the included charging cable.



4.5 Using the 3D Glasses

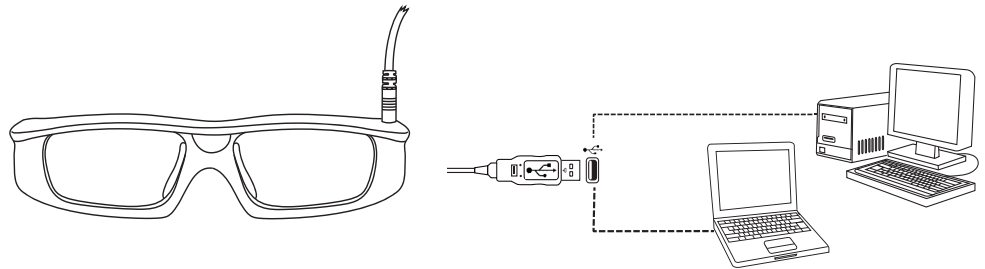
◀ Key Features

◀ Functional Overview

- Charging the Battery** ➤ The glasses must be fully charged before first use and whenever the Battery Status LED flashes red once every couple of seconds. The glasses will charge a completely dead battery in approximately five hours. You may use the glasses while the battery is being charged.

To charge the 3D Glasses:

1. Attach one end of the supplied charging cable to the Power Input above the left lens on the glasses.
2. Attach the other end of the cable to any USB "A" port on a USB hub, personal computer or display device. The Battery Status LED lights solid red while the battery is charging.



Note

When attached to a computer, the Runco Active 3D Glasses use the computer only to receive power; the glasses do not appear as a device visible to Windows or any other operating system.

3. When the Battery Status LED lights solid blue, the battery is fully charged. You can disconnect the glasses from the power source.

The battery in the 3D glasses is designed to operate approximately 15 hours on a full charge. The glasses consume more power as needed to maximize reliability. As a result, battery life is a function of many factors, including how much interference from 2.4-GHz devices like wireless routers must be compensated. Under worst-case conditions, fully-charged glasses should operate flawlessly for a minimum of about 12 hours.

1. Ensure that the projector is powered on and displaying 3D content.
2. Press and hold the Power Button for about two seconds, then release the button. The LED then blinks in a pattern that indicates the battery charge state. In general, the more slowly and less frequently the LED blinks, the more charged (and less in need of charge) the glasses are. Refer to Table 4-3.

◀ **Turning On the Glasses**

Table 4-3. Battery Charge State Indications

Blink Activity After Power-on	Battery Charge State
Three (3) blue blinks (one second on, one second off)	Battery is fully charged; 12 to 15 hours remaining.
Six (6) blue blinks	Battery is 50% charged; approximately 4 hours remaining.
Nine (9) blue blinks	Battery is 30% or more charged; approximately 2 hours remaining.
Red blink	Battery charge is 10% or less; glasses must be charged before further use.

3. The glasses will sync with the emitter and the 3D content will be visible through the glasses.
4. Repeat Step 2 for each pair of glasses you wish to sync to the emitter.

If the glasses do not detect an emitter, the LED blinks on and off once per second for five minutes. Then, to preserve battery life, the glasses automatically turn off. If the emitter is activated (the emitter is only active when the projector is in 3D mode) before the five-minute period ends, the glasses stop blinking and remain on.

◀ **Auto Power-Off**

If the glasses automatically turn off, press the Power button to turn them back on.

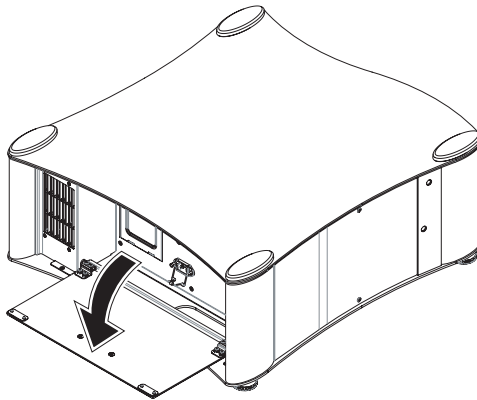
Notes:

5. Maintenance and Troubleshooting

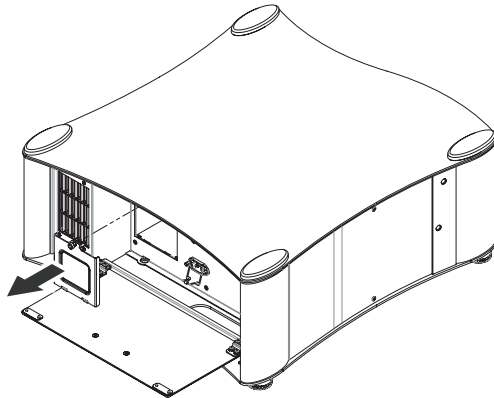
The lamp should be replaced when it reaches the end of its life (typically between 1,500 and 3,000 hours), or sooner if a noticeable degradation in brightness occurs. Contact your Runco dealer to obtain a replacement lamp.

5.1 Lamp Replacement

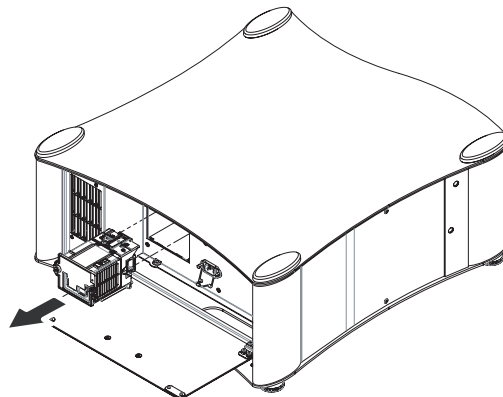
1. Turn off the projector and unplug the power cord. **Allow the projector to cool down for approximately 60 minutes prior to removing the lamp assembly for replacement.**
2. Open the rear door of the projector by grasping the handle and pulling it downward.



3. Loosen the captive screw on the lamp cover and pull the lamp cover out.



4. Loosen the two screws on the lamp module.
5. Pull the lamp module handle firmly to remove the lamp module.
6. Perform Steps 5 through 2 (in reverse order) to install the new lamp module.
7. Turn on the power. The lamp timer will reset automatically.



5.2 Troubleshooting Tips

Table 5-1 provides some general guidelines for troubleshooting problems you may encounter with the X-200i. If the suggested solutions fail to resolve the problem or if you encounter an issue not described here, please contact Runco Technical Support.

Table 5-1. Troubleshooting Chart

Symptom	Possible Cause(s)	Solution
The projector does not turn on.	<ul style="list-style-type: none"> The X-200i is not plugged in or the AC outlet is not active. Lamp cover is not securely attached. 	<ul style="list-style-type: none"> Ensure that the X-200i is plugged in and that the AC outlet is active. Securely attach the lamp cover.
The projector does not turn back on after it was powered off.	<ul style="list-style-type: none"> The projector will not turn on for two minutes after power-off, to protect the lamp. 	<ul style="list-style-type: none"> Wait until the X-200i completes its cool-down (POWER LED lights solid blue).
The remote control does not work correctly.	<ul style="list-style-type: none"> The batteries have run out. IR code set mismatch between remote control unit and projector. 	<ul style="list-style-type: none"> Replace the batteries. Press and hold the LIGHT and ENTER remote control buttons simultaneously until the remote control back-lighting “blinks” (approximately five seconds). Then, try again.
The projector is on and OSD menus appear, but there is no video image on-screen.	<ul style="list-style-type: none"> Incorrect source selection. Source component is not turned on. Source component is connected incorrectly or not at all. 	<ul style="list-style-type: none"> Select the correct source. Turn on the source. Check cable connection from source component to projector.
A projected image from a DVD is split or otherwise scrambled.	<ul style="list-style-type: none"> DVD player is connected to the Component input and set to progressive scan mode. 	<ul style="list-style-type: none"> Turn off progressive scan on the DVD player.
Image is blurred.	<ul style="list-style-type: none"> The lens is not correctly focused. 	<ul style="list-style-type: none"> Adjust the focus.
Image is too bright and/or lacks definition in the bright areas of the image.	<ul style="list-style-type: none"> Contrast is set too high. 	<ul style="list-style-type: none"> Lower the contrast setting.
Image appears “washed out” and/or dark areas appear too bright.	<ul style="list-style-type: none"> Brightness is set too high. 	<ul style="list-style-type: none"> Lower the brightness setting.

Note: You can obtain more detailed information about the cause of the error condition using RS-232 commands. Refer to **RS-232 Error Codes** on page 91 for more information.

Table 5-1. Troubleshooting Chart (continued)

Symptom	Possible Cause(s)	Solution
Colors in the image are swapped; for example, reds appear blue or vice versa.	<ul style="list-style-type: none"> The Red/Pr, Green/Y or Blue/Pb outputs from the source are connected to the wrong inputs on the X-200i. 	<ul style="list-style-type: none"> Ensure that the source outputs are connected to the correct X-200i input.
ISSUE LED is flashing red (one short flash).	<ul style="list-style-type: none"> The lamp has failed or exceeded its usage life. 	<ul style="list-style-type: none"> Replace the lamp with a new one.
ISSUE LED is flashing red (two short flashes).	<ul style="list-style-type: none"> The lamp cover is open. 	<ul style="list-style-type: none"> Close the lamp cover.
ISSUE LED is flashing red (four short flashes).	<ul style="list-style-type: none"> X-200i internal temperature is too high. 	<ul style="list-style-type: none"> Power off the X-200i and allow it to cool down. Ensure that the intake and exhaust vents are not blocked. Turn the projector back on. If the problem persists, please contact Runco Technical Support for assistance.
ISSUE LED lights solid red.	<ul style="list-style-type: none"> Fans are not working properly or power-on self-test has failed (Note). 	<ul style="list-style-type: none"> Please contact Runco Technical Support for assistance.
When displaying 3D content, crosstalk or “ghosting” can be seen — that is, the left eye is perceiving some of what the right eye should be seeing or vice versa.	<ul style="list-style-type: none"> Rear-projection installation uses second-surface mirrors that are producing faint, secondary reflections. 	<ul style="list-style-type: none"> Always use first-surface mirrors in your rear-projection installation.
With 3D glasses, image perspective is reversed — that is, “left-eye” frames appear in the right lens and vice versa.	<ul style="list-style-type: none"> Incorrect L-R Swap setting. 	<ul style="list-style-type: none"> Change the L-R Swap setting (refer to L-R Swap on page 58).
3D glasses do not work.	<ul style="list-style-type: none"> Glasses are not charged and/or communicating with the Active3D Emitter. 	<ul style="list-style-type: none"> Refer to Using the 3D Glasses on page 73.
<p>Note: You can obtain more detailed information about the cause of the error condition using RS-232 commands. Refer to RS-232 Error Codes on page 91 for more information.</p>		

Notes:

6. External Control

In addition to using the X-200i keypad or remote control unit, there are three methods of controlling the projector externally:

- Using a serial (RS-232) link to send ASCII commands and receive responses to those commands.
- Using discrete infrared (IR) codes to program a third-party remote control unit.
- Using an HDMI connection to send Consumer Electronics Control (CEC) commands from a BD player or other source component that supports CEC.

The following sections describe these methods.

The DHD Controller uses a simple text-based control protocol to take requests from control devices and to provide responses to such devices. This section describes how to send control messages over a serial link between the X-200i and an automation/control system or a PC running terminal emulation software.

To interface the X-200i with a home theater automation/control system or a PC running terminal emulation software:

1. Connect it to your control system or PC as shown in Figure 3-14.
2. Start a terminal session on your PC using a terminal-emulation program, such as HyperTerminal.
3. Configure the RS-232 controller or PC serial port as follows: 9600 bps, no parity, 8 data bits, 1 stop bit and no flow control.
4. Type **ky** or **op** followed by a command from among those listed in Table 6-1 or Table 6-2 and press **<Enter>**. For example, to change the aspect ratio to Letterbox, type `op aspect = 1<Enter>`.

Serial commands to the X-200i take the following form:

- Commands are in ASCII format.
- Spaces and tabs can be used to improve readability and are ignored by the projector.
- All commands must end with a carriage return (ASCII hex 0D) to signify that the projector can now read and execute the command.
- Commands are not case-sensitive.

The X-200i supports two types of commands: key commands and operation commands. Key commands mimic pressing a button on the remote control. Operation commands tell the projector exactly what to do.

All commands start with 2 letters:

ky for key commands.

op for operations commands.

6.1 Serial Communications

◀ RS-232 Connection and Port Configuration

◀ Command Format

Key Commands: The syntax for key commands is simple:

ky <keyname>[CR]

Some key command examples:

ky menu[CR] Bring up or cancel menu display.

ky cur.up[CR] Up arrow.

The response from the projector for key commands is **ACK:** followed by the same command in **UPPERCASE**.

Input: **ky menu**[CR]

Response: **ACK:MENU** [CR]

Table 6-1 lists the serial command key names and IR codes.

Table 6-1. Serial Command Key Names and IR Codes











RS232 Keyname	Remote Button	IR Code		Description
		Set 1	Set 2	
		0x01	0xB7	Turn power on.
	(none)	0x02	0xB8	Switch to the next source.
		0x09	0xB9	Turn power off.
menu		0x15	0xBA	Bring up or cancel menu display.
enter		0x17	0xBB	Keypad enter.
cur.down		0x18	0xBC	Keypad down arrow.
cur.up		0x1A	0xBD	Keypad up arrow.
cur.left		0x1D	0xBE	Keypad left arrow.
cur.righ		0x1F	0xBF	Keypad right arrow.
		0x80	0xC0	Bring up or cancel brightness slider.
		0x81	0xC1	Bring up or cancel contrast slider.
	(none)	0x84	0xC4	Force reacquisition of active source.
	(none)	0x85	0xC5	Switch to the next gamma.
	(none)	0x86	0xC6	Switch to 2.5 gamma.

Table 6-1. Serial Command Key Names and IR Codes (continued)





















RS232 Keyname	Remote Button	IR Code		Description
		Set 1	Set 2	
	(none)	0x87	0xC7	Switch to 2.2 gamma.
		0x8B	0xCB	Switch the active source to HDMI 1.
		0x8C	0xCC	Switch the active source to HDMI 2.
		0x8D	0xCD	Switch the active source to Component 1.
		0x8E	0xCE	Switch the active source to Component 2.
		0x8F	0xCF	Switch the active source to RGB.
	(none)	0x90	0xD0	Toggles between blank screen and regular display.
	(none)	0x91	0xD1	Turn blank screen on.
	(none)	0x92	0xD2	Turn blank screen off.
	(none)	0x93	0xD3	Switch to the next Overscan mode.
	(none)	0x94	0xD4	Switch to Overscan Zoom.
	(none)	0x95	0xD5	Switch to Overscan Crop.
	(none)	0x96	0xD6	Switch to Overscan Off.
	(none)	0x97	0xD7	Switch to the next user memory.
		0x98	0xD8	Recall Custom 1 user memory.
		0x99	0xD9	Recall Custom 2 user memory.
		0x9B	0xDB	Recall ISF Day user memory.
		0x9C	0xDC	Recall ISF Night user memory.
		0x9D	0xDD	Switch to the next aspect ratio.
		0x9E	0xDE	Apply 16:9 aspect ratio to the active source.
		0x9F	0xDF	Apply 4:3 aspect ratio to the active source.
		0xA0	0xE0	Apply Letterbox aspect ratio to the active source.
		0xA2	0xE2	Apply VirtualWide aspect ratio to the active source.
		0xAF	0xEF	Apply Cinema aspect ratio to the active source.

Table 6-1. Serial Command Key Names and IR Codes (continued)

RS232 Keyname	Remote Button	IR Code		Description
		Set 1	Set 2	
		0xB0	0xF0	Apply Virtual Cinema aspect ratio to the active source.
	(none)	0xAC	0xEC	Toggles between power on and power off.
		0xAD	0xED	Activates remote backlighting only when pressed momentarily.
		0xB1	0xF1	Switch to 3D Auto mode.
		0xB2	0xF2	Switch to 3D Side-by-side mode.
		0xB3	0xF3	Switch to 3D Top-and-bottom mode.

Operations Commands: Operations commands allow more flexible and direct control of the projector. The syntax for operations commands is as follows:

op <operation> <command> [CR]

(Precede <operation> and <command> with a space.)

The command type can be one of three functions:

Operations Control Commands		
Function	Command	Action on unit
Set	= <value>	Makes the unit take that value.
Get	?	Asks what the current value is.
Execute	(none)	Performs an action such as a reset.

Table 6-2 lists the valid operations commands. For Set and Get functions, the response from the projector is **ACK:** followed by the command and = <value> where <value> is the current value or **ERR:NA** if the value is not available. For Execute functions the response is **ACK:** followed by the command. All responses are in **UPPERCASE**.

Some operations command examples:

Input: **op bright ? [CR]**

Response: **ACK:BRIGHT = 100 [CR]**

Input: **op bright = 127 [CR]**

Response: **ACK:BRIGHT = 127 [CR]**

Input: **op resync [CR]**

Response: **ACK:RESYNC [CR]**

Input: **op input = 0 [CR]**

Response: **ACK:INPUT = 0 [CR]**

Input: **op phase = 50 [CR]**

Response: **ERR:NA [CR]**

Input: **op phase ? [CR]**

Response: **ERR:NA [CR]**

The last three commands show what happens when a control is unavailable. In this case, the source was set to "HDMI 1" (value = 0) and then the phase slider was attempted to be adjusted and queried. The response was "NA" or not available.

Table 6-2. Serial Commands

Operation	Commands	Values	Notes
powon	(execute)		Power on command
powoff	(execute)		Power off command
3d.mode	= ?	0 = Auto 1 = Side-by-side 2 = Top-and-bottom 3 = Off	
3d.chswap	= ?	0 = Normal 1 = Reversed Eyes	
aspect	= ?	0 = 16:9 1 = Letterbox 2 = 4:3 3 = VirtualWide 4 = Cinema 5 = Virtual Cinema	
recall.mem	= ?	0 = Custom 1 1 = Custom 2 2 = ISF Day 3 = ISF Night 4 = Default	? only returns a value if ISF Day or ISF Night is active, otherwise it returns NA
save.mem	=	0 = Custom 1 1 = Custom 2	
save.isf	=	0 = ISF Day 1 = ISF Night	
brightness	= ?	0 - 200	
contrast	= ?	0 - 200	
saturation	= ?	0 - 200	
hue	= ?	0 - 200	
sharpness	= ?	0 - 200	
nr	= ?	0 - 200	
overscan	= ?	0 = Off 1 = Crop 2 = Zoom	

Table 6-2. Serial Commands (continued)

Operation	Commands	Values	Notes
resync	(execute)		
color.space	= ?	0 = Auto 1 = REC709 2 = REC601 3 = RGB-PC 4 = RGB-Video	
gamma	= ?	0 = 1.8 1 = 2.0 2 = 2.2 3 = 2.35 4 = 2.5	
color.temp	= ?	0 = 5500K 1 = 6500K 2 = 7500K 3 = 9300K 4 = Native	
frame.rate	= ?	0 = Auto 2 = 48 Hz 3 = 50 Hz 4 = 60 Hz	
color.gamut	= ?	0 = Auto 1 = REC709 2 = SMPTE C 3 = EBU 4 = Native 6 = PCE	
satco	= ?	0 = Off 1 = On	
red.offset	= ?	0-200	
green.offset	= ?	0-200	
blue.offset	= ?	0-200	
red.gain	= ?	0-200	
green.gain	= ?	0-200	
blue.gain	= ?	0-200	
vert.pos	= ?	0-200	
horiz.pos	= ?	0-200	
phase	= ?	0-200	
tracking	= ?	0-200	
sync.level	= ?	0-200	

Table 6-2. Serial Commands (continued)

Operation	Commands	Values	Notes
blank.screen	= ?	0 = Logo 1 = Black 2 = Blue 3 = White	
logo.disp	= ?	0 = Off 1 = On	
auto.poweroff	= ?	0 = Off 1 = On	
auto.poweron	= ?	0 = Off 1 = On	
proj.mode	= ?	0 = Front Tabletop 1 = Front Ceiling 2 = Rear Tabletop 3 = Rear Ceiling	
model.name	?	<string>	
ser.number	?	<string>	
soft.version	?	<string>	
h.refresh	?	<number>	kHz
v.refresh	?	<number>	Hz
pixel.clock	?	<number>	MHz
signal	?	<string>	
lamp.hours	?	<number>	
total.hours	?	<number>	
factory.reset	(execute)		
pattern	=	0 = Off 1 = White 2 = Black 3 = Red 4 = Green 5 = Blue 6 = Cyan 7 = Magenta 8 = Yellow 9 = ANSI Checkerboard 10 = Focus Grid	
altitude	= ?	0 = Auto 1 = High	
status.check	?	0 = Standby 1 = Powering Up 2 = Displaying 3 = Cooling Down 4 = Error	

Table 6-2. Serial Commands (continued)

Operation	Commands	Values	Notes
trig1 trig2	= ?	0 = Lamp 3 = 4:3 4 = AutoScope 5 = RS232 6 = On 7 = Off	
adcontrast	= ?	0 = Off 1 = On	
blue.only	=	0 = Off 1 = On	
osd.timer	= ?	0 = forever 1 = 10 sec. 2 = 30 sec. 3 = 60 sec.	
ir.enable	= ?	0 = Disable 1 = Code 1 2 = Code 2	
menu.pos	= ?	0 = Top left 1 = Top right 2 = Bottom left 3 = Bottom right 4 = Center	
trans.menu	= ?	0 = 0% 1 = 25% 2 = 50% 3 = 75%	
environment	?	<string>	temperatures
language	= ?	0 = English 1 = French 2 = German 3 = Italian 4 = Spanish 5 = Swedish 6 = Simplified Chinese 7 = Traditional Chinese 8 = Japanese 9 = Korean 10 = Portuguese 11 = Russian	OSD language only
framelock	= ?	0 = Off 1 = On	2D sources only
3D.24p.mode	= ?	0 = 96Hz 1 = 144Hz	
3D.darktime	= ?	0 = 1.0 ms 1 = 1.5 ms 2 = 2.0 ms 3 = 2.5 ms	

Table 6-2. Serial Commands (continued)

Operation	Commands	Values	Notes
3D.syncdelay	= ?	100 +/- 40 ms	
3D.syncinvert	= ?	0 = Normal 1 = Inverted	
power.chime	= ?	0 = Off 1 = On	
errcode	?	Refer to RS-232 Error Codes on page 91.	
lamp.vol	?	<string>	returns lamp voltage
cinewide	= ?	0 = Off 1 = CineWide 2 = AutoScope	
red.hsg.hue yellow.hsg.hue green.hsg.hue cyan.hsg.hue blue.hsg.hue magenta.hsg.hue	= ?	0-200	Personal Color Equalizer (PCE) hue settings.
red.hsg.sat yellow.hsg.sat green.hsg.sat cyan.hsg.sat blue.hsg.sat magenta.hsg.sat	= ?	0-200	Personal Color Equalizer (PCE) saturation settings.
red.hsg.gain yellow.hsg.gain green.hsg.gain cyan.hsg.gain blue.hsg.gain magenta.hsg.gain	= ?	0-200	Personal Color Equalizer (PCE) level settings.
white.red.gain white.green.gain white.blue.gain	= ?	0-200	Personal Color Equalizer (PCE) white balance settings.
msgbox	= ?	0 = On 1 = Off	This control enables or disables the display of power off, source and adjustment message boxes (brightness, contrast etc.). Default value is ON.

Table 6-2. Serial Commands (continued)

Operation	Commands	Values	Notes
cal.text1 cal.text2 cal.text3	=	Up to 30 characters.	The X-200i start-up screen is customizable with three lines of text of up to 30 characters each. This text appears below the "CALIBRATED FOR:" text in the logo screen. The allowable characters are all numbers, letters (uppercase and lowercase), spaces, and symbols available in the ASCII code set.
3d.dlplink	= ?	0 = Off 1 = On	
3d.pattern	= ?	0 = Off 1 = On	3D Test Pattern enable/disable
cec.enable	= ?	0 = Off 1 = On	HDMI CEC enable/disable
act.source	?		Query current input source
prerr	(execute)		Query the error log
hsg	= ?	00 - C8 (0 - 200 decimal) for each of the following, in this order: Red Hue Yellow Hue Green Hue Cyan Hue Blue Hue Magenta Hue Red Saturation Yellow Saturation Green Saturation Cyan Saturation Blue Saturation Magenta Saturation Red Level Yellow Level Green Level Cyan Level Blue Level Magenta Level Red Gain (White Balance) Green Gain (White Balance) Blue Gain (White Balance)	This command provides an alternative to setting the PCE Hue, Saturation, Level and White Balance values using individual commands. It is only available when <code>color.gamut = 6</code> (PCE). The value string is 21 bytes (42 characters) long. Each byte sets the corresponding PCE parameter; refer to the list at left. Example: This command sets all PCE parameters to 100 (50%): hsg = 64 (Spaces are for readability.)

If an **errcode ?** command returns one of the following values, you have encountered a likely system error requiring the attention of a qualified service technician. Try resetting the projector by powering it off, allowing it to cool and powering it on again. Refer to Table 6-3 and contact your dealer if the problem persists.

◀ RS-232 Error Codes

The specific code number identifies the source of the error detected, and is particularly useful in cases where the projector is far away. For example, the code “21” means that Fan 1 has failed.

Table 6-3. RS-232 Error Codes

Error Code	LED Indication	Description
1		Inlet NTC thermal sensor is over temperature.
3		Lamp 1 over temperature.
7		Ballast 1 over temperature.
20		Fan failure upon system power-up.
21		Fan 1 locked.
22		Fan 2 locked.
23		Fan 3 locked.
24		Fan 4 locked.
25		Fan 5 locked.
26		Fan 6 locked.
27		Fan 7 locked.
28		Fan 8 locked.
29		Fan 9 locked.
40		Lamp failed to ignite (three attempts) upon system power-up.
41		Lamp failed during operation.
42		Ballast UART communication failure.
50		Lamp door is open.
52		PCF8575 external GPIO communication failure.
53		System I2C communication failure.
54		Write EEPROM failure.
60		DDP3021 communication failure upon system power-up.
61		Video board initialization failure.
62		DCF FPGA communication failure upon system power-up.
63		OSD loading error.
64		Scaler (GF9452) is not responding.

6.2 Using Discrete IR Codes

The X-200i accepts commands in the form of IR signals that conform to the NEC protocol. Each X-200i remote control button has an NEC control code associated with it.

As shown in Table 6-1, there are two complete sets of remote codes (designated “Set 1” and “Set 2”). Through the on-screen menu, the projector can be configured to use either set. The reason for two sets is to allow control of more than one product in the same room without interference. The remote control can also be configured to use either code set (refer to **Infrared Remote** on page 71).

You can use these codes to program a third-party, “universal” remote control unit to work with the X-200i. These third-party products usually come with a computer software application for this purpose. For more information, consult the documentation provided with the remote control unit.

IR Command Protocol ➤

The IR control codes have the following characteristics:

- Each code consists of the following:
 - A **leader pulse** (a modulated pulse of 9 ms followed by a non-modulated pulse of 4.5 ms);
 - 16 **address bits - 0x06 0xF9** (binary 00000110 11111001);
 - 16 **data bits**: eight (8) bits for the command followed by the logical inverse of the command; and
 - An **end pulse** (a modulated pulse of 0.56 ms, similar to the modulated pulse in the ‘0’ and ‘1’ bits).The end of the modulated pulse constitutes the end of the data transmission.
- The carrier frequency is 38 kHz, with the modulated pulses having a 33% duty cycle.
- Commands are sent at a maximum rate of 9 Hz.

For example, here is the NEC control code for the **ON** (ON) button on the X-200i remote control unit (using Code Set 1):

Hex	06	F9	01	FE
Binary	00000110	11111001	00000001	11111110
Function	Address Byte 1	Address Byte 2	Command	Command (Logical Inverse)

Figure 6-1 shows the pulse train for this command.



Figure 6-1. NEC Protocol Message Format

The X-200i accepts and can respond to CEC command messages from a disc player, satellite receiver or DVR/set-top box via an HDMI connection. Using CEC, the X-200i can perform the following actions:

- Turn itself on and select the correct input when the source component initiates playback of a disc or recorded program.
- Turn the source component on when you switch to its corresponding input on the X-200i.
- Turn the source component off when the X-200i is turned off (unless the source component is in playback mode).
- Change its OSD language when a similar change is made at the source.

To use CEC, connect your CEC-compatible sources to the HDMI inputs on the X-200i. Set the HDMI CEC option to **On** (refer to **HDMI CEC** on page 71). Additional steps may be needed to enable CEC at the source. Refer to the documentation for your source device for more information.

Table 6-4 lists the CEC commands supported by the X-200i.

Table 6-4. CEC Commands Supported by the X-200i

Opcode	Value	Parameters	Directly Addressed	Broadcast
Feature Abort	0x00	[Feature Opcode] [Abort Reason]	Yes	No
Image View On	0x04	None	Yes	No
Set Menu Language	0x32	[Language]	No	Yes
Standby	0x36	None	Yes	Yes
User Control Pressed	0x44	[UI Command]	Yes	No
User Control Released	0x45	None	Yes	No
Give OSD Name	0x46	None	Yes	No
Set OSD Name	0x47	[OSD Name]	Yes	No
Vendor Remote Button Up	0x5B	[Vendor Specific RC Code]	Yes	Yes
Active Source	0x82	[Physical Address]	No	Yes
Give Physical Address	0x83	None	Yes	No
Report Physical Address	0x84	[Physical Address] [Device Type]	No	Yes
Request Active Source	0x85	None	No	Yes
Set Stream Path	0x86	[Physical Address]	No	Yes
Device Vendor ID	0x87	[Vendor ID]	No	Yes
Vendor Command	0x89	[Vendor Specific Data]	Yes	No

6.3 Using HDMI CEC Messages

◀ CEC Command List

Table 6-4. CEC Commands Supported by the X-200i (continued)

Opcode	Value	Parameters	Directly Addressed	Broadcast
Vendor Remote Button Down	0x8A	[Vendor Specific RC Code]	Yes	Yes
Give Device Vendor ID	0x8C	None	Yes	No
Menu Request	0x8D	[Menu Request Type]	Yes	No
Menu Status	0x8E	[Menu State]	Yes	No
Give Device Power Status	0x8F	None	Yes	No
Report Power Status	0x90	[Power Status]	Yes	No
Get Menu Language	0x91	None	Yes	No
Inactive Source	0x9D	[Physical Address]	Yes	No
CEC Version	0x9E	[CEC Version]	Yes	No
Get CEC Version	0x9F	None	Yes	No
Vendor Command With ID	0xA0	[Vendor ID] [Vendor Specific Data]	Yes	Yes
Abort Message	0xFF	None	Yes	No
Polling Message	N/A	None	Yes	No

7. Specifications

Table 7-1 lists the X-200i specifications.

Table 7-1. X-200i Specifications

Projector Type	Digital Light Processing™ (DLP™), Single-Chip, 16:9 SuperOnyx™ DMD™, 3D Capable
Native Resolution	Full HD 1920 x 1080 (1080p)
Aspect Ratios	16:9, 4:3, Letterbox, VirtualWide, Cinema, VirtualCinema
Video Standards	HDMI with HDCP for digital video; Component and RGB (1080p, 1080i, 720p, 576p, 480p); CEA-861D, HDMI 3D
Video Compatibility	Refer to Table 7-2
Picture Size (16:9 Screens)	Recommended Width: 78 - 112 in. Maximum Width: 171 in.
Throw Distance (Factor x Screen Width)	Refer to Table 3-3
Horizontal & Vertical Offset	Refer to Table 3-4
Light Output (84" wide, 1.0 gain, 16:9 screen)	CSMS Specifications Home Theater Calibration: 1376 ANSI Lumens; 50 Foot-Lamberts (fL) 1430 ANSI Lumens (uncalibrated)
Contrast Ratio	CSMS Contrast Ratio: >200:1; 1300:1 full-on, full-off.
Lamp	320W HPM lamp
Lamp Life	1500 hours typical
Inputs	(2) HDMI; (2) Component; (1) RGB (HD15); (1) RS-232; (1) IR Repeater
Power Requirements	100 VAC to 240 VAC +/- 10% @ 50/60Hz & 500W maximum
Operating Environment	Temperature: 50 °F to 104 °F (10 °C to 40 °C) Humidity: 0% to 85% relative humidity (non-condensing)
Regulatory Approvals	FCC Part 15 Class B, CE Class B, UL, cUL, CB, RoHS, WEEE, local conformances as required
12V Output	(2) 3.5mm mini jack
Dimensions	See Figure 7-1
Lamp Warranty	1000 hours or six (6) months, whichever comes first
Weight	60.9 lbs. (27.7kg)

7.1 X-200i Specifications

Table 7-1. X-200i Specifications (continued)

Limited Warranty	Projector: (2) Two years parts and labor from the date of shipment from Runco. Extended RuncoCare™, Red Carpet™, and PremierCare™ also available.
Processor	Dual Stream Vivix™ technology processing
Control Options	<ul style="list-style-type: none"> • Discrete infrared (IR) remote • System keypad on rear panel • Serial commands via RS-232 • Consumer Electronics Control (CEC) protocol support via HDMI
Calibration	ISF Certified Calibration Configuration
Color Gamut	> BT.709 (REC709)
Lens System	Manual focus, zoom, vertical and horizontal offset
Refresh Rate	2D: 48 Hz / 50 Hz / 60 Hz 3D: 96 Hz / 100 Hz / 120 Hz / 144 Hz
3D Technology	Frame sequential, active shutter
Specifications are subject to change without notice.	

Figure 7-1 shows the X-200i dimensions, in millimeters.

7.2 X-200i Dimensions

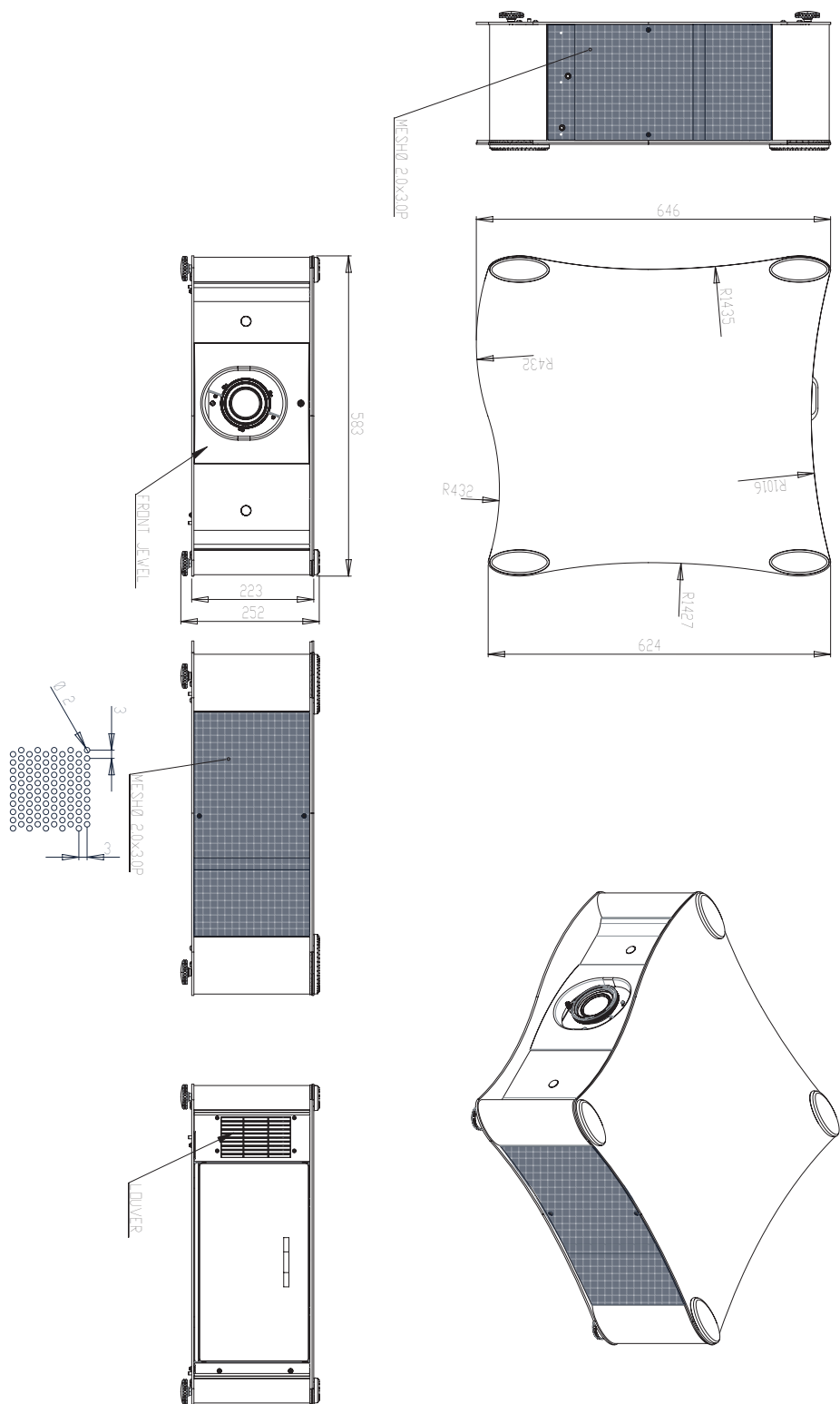


Figure 7-1. X-200i Dimensions

7.3 Supported Timings

Table 7-2 lists the signal types supported by each input on the X-200i.

Table 7-2. Supported Signal Timings by Input

Format	Resolution	Refresh Rate (Hz)	Horizontal Frequency (kHz)	Pixel Frequency (MHz)	Supported? (√ = Yes, – = No)		
					RGB	Component 1 Component 2	HDMI 1 HDMI 2
Supported 3D Modes							
1080i SBS (Side-by-Side)	1920x1080	50.00	28.125/31.250	74.250/72.000	–	–	√
		59.94	33.716	74.175	–	–	√
		60.00	33.750	74.250	–	–	√
720p TAB (Top-and-Bottom)	1280x720	50.00	37.500	75.250	–	–	√
		59.94	44.715	74.406	–	–	√
		60.00	45.000	74.250	–	–	√
720p SBS (Side-by-Side)	1280x720	50.00	37.500	75.250	–	–	√
		59.94	44.715	74.406	–	–	√
		60.00	45.000	74.250	–	–	√
720p FP (Frame Packing)	1280x720	50.00	37.500	75.250	–	–	√
		59.94	44.715	74.406	–	–	√
		60.00	45.000	74.250	–	–	√
1080p SBS (Side-by-Side)	1920x1080	23.98	26.978	74.175	–	–	√
		24.00	27.000	74.250	–	–	√
		29.97	33.716	74.175	–	–	√
		30.00	33.750	74.250	–	–	√
		50.00	56.250	148.500	–	–	√
		59.94	67.433	148.350	–	–	√
		60.00	67.500	148.500	–	–	√
1080p TAB (Top-and-Bottom)	1920x1080	23.98	26.978	74.175	–	–	√
		24.00	27.000	74.250	–	–	√
		29.97	33.716	74.175	–	–	√
		30.00	33.750	74.250	–	–	√
		50.00	56.250	148.500	–	–	√
		59.94	67.433	148.350	–	–	√
		60.00	67.500	148.500	–	–	√
1080p FP (Frame Packing)	1920x1080	23.98	26.978	74.175	–	–	√
		24.00	27.000	74.250	–	–	√

Table 7-2. Supported Signal Timings by Input (continued)

Format	Resolution	Refresh Rate (Hz)	Horizontal Frequency (kHz)	Pixel Frequency (MHz)	Supported? (√ = Yes, – = No)		
					RGB	Component 1 Component 2	HDMI 1 HDMI 2
Supported 2D Modes							
640x480	640x480	60.00	31.469	25.175	√	–	√
		66.59	35.892	29.862	√	–	√
		75.00	37.500	31.500	√	–	√
		85.00	43.269	36.000	√	–	√
800x600	800x600	60.00	37.879	40.000	√	–	√
		75.00	46.875	49.500	√	–	√
		85.00	53.674	56.250	√	–	√
832x624	832x624	74.54	52.849	60.036	√	–	√
848x480	848x480	48.00	25.270	27.089	√	–	√
		60.00	31.020	33.750	√	–	√
1024x768	1024x768	60.00	48.363	65.000	√	–	√
		75.00	60.023	78.750	√	–	√
		85.00	68.677	94.500	√	–	√
1280x720	1280x720	47.95	37.833	64.769	√	–	√
1280x1024	1280x1024	60.00	63.981	108.000	√	–	√
		75.00	79.976	135.000	√	–	√
		85.00	91.146	157.500	√	–	√
1600x1200	1600x1200	60.00	75.000	162.000	√	–	√
1680x1050	1680x1050	59.94	69.830	164.240	√	–	√
1920x1080	1920x1080	47.95	56.821	150.007	√	–	√
480/60i	720x487	59.94	15.734	13.500	–	√	√
480/60p	720x483	59.94	31.469	27.000	√	√	√
576/50i	720x576	50.00	15.625	14.750	–	√	√
576/50p	720x576	50.00	31.250	29.000	√	√	√
720/50p	1280x720	50.00	37.500	75.250	√	√	√
720/60p	1280x720	60.00	45.000	74.250	√	√	√
1080/50i	1920x1080	50.00	28.125/31.250	74.250/72.000	√	√	√
1080/60i	1920x1080	59.94/60.00	33.716/33.750	74.175/74.250	√	√	√
1080/24p	1920x1080	23.98/24.00	26.978/27.000	74.175/74.250	√	√	√
1080/50p	1920x1080	50.00	56.250	148.500	√	√	√
1080/60p	1920x1080	59.94/60.00	67.433/67.500	148.350/148.500	√	√	√

Notes:

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